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Contractors and Engineers

JUNE 1953

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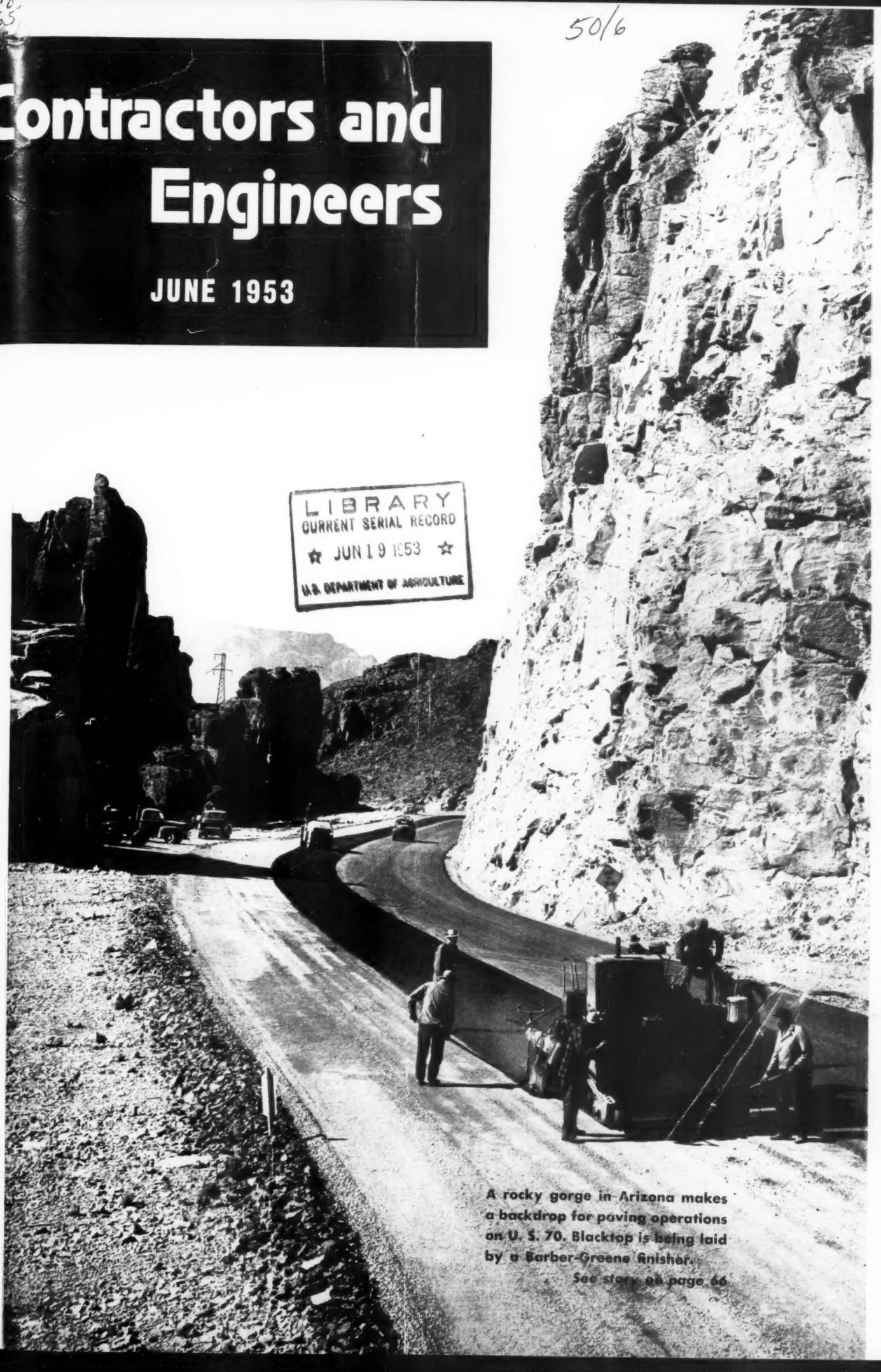


A rocky gorge in Arizona makes a backdrop for paving operations on U. S. 70. Blacktop is being laid by a Barber-Greene finisher.

See story on page 66

Unit Water Content Is Key To Concrete Quality And Economy Say Top Authorities

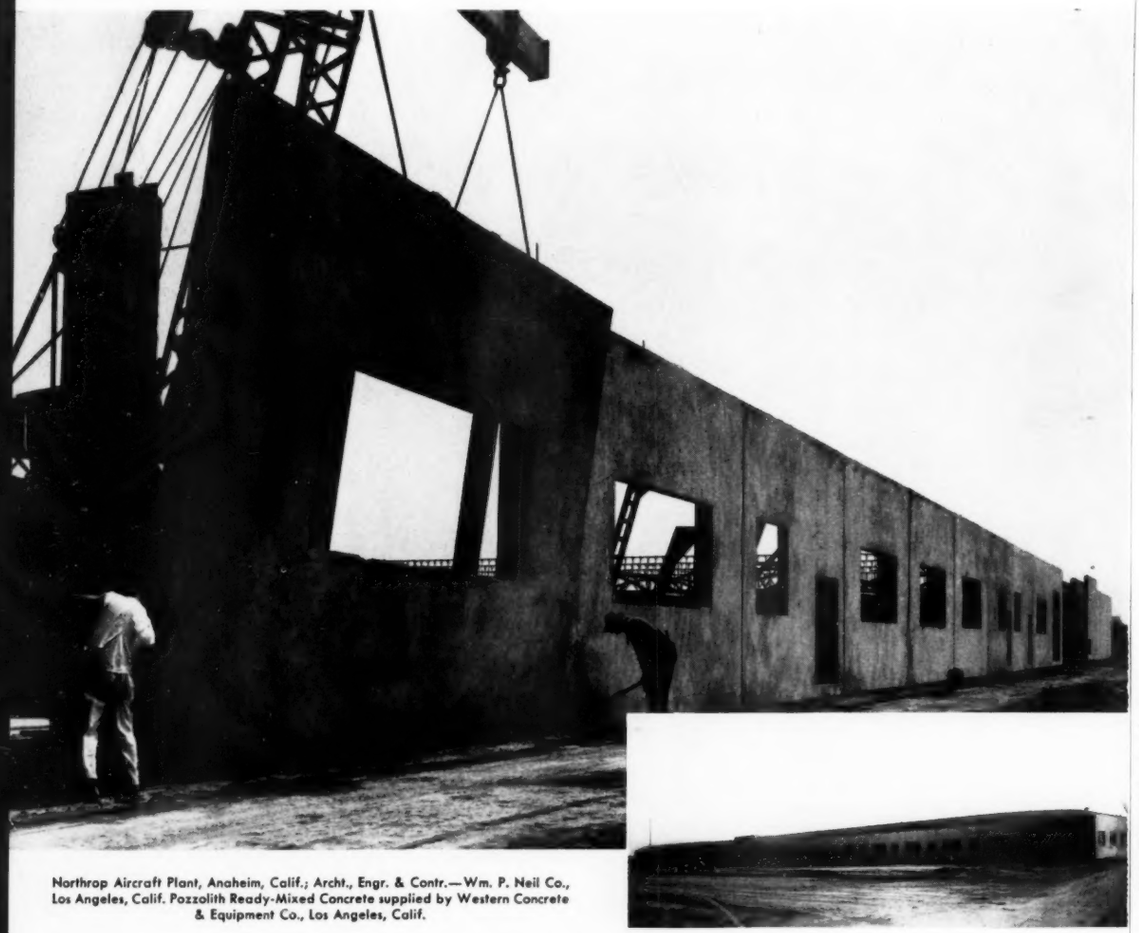
Every builder wants the best quality concrete he can get. He also wants the most economical concrete he can get. Both quality and economy are importantly affected by unit water content—amount of water required per cubic yard of concrete—according to leading authorities.

As stated by the American Concrete Institute—"For a given set of materials and water-cement ratio, the unit water content . . . is the most important basic factor affecting the quality of concrete. . . . Obviously, for a given water-cement ratio, the mix requiring the lowest water content will also require the least cement." (ACI 613-44, Page 655)

U. S. Bureau of Reclamation, another recognized authority in the concrete field, says ". . . for a given water-cement ratio and degree of workability, the least practicable amount of paste will result in improved quality of concrete for most purposes, principally because of the attendant reduction in the unit water content." (Concrete Manual, Fourth Edition, Page 46)

Builders the country over have found that Pozzolith* is a positive aid in obtaining better, more economical concrete because it provides the *lowest unit water content* for a mix of given strength, given workability and with a given set of materials. Pozzolith improves all the basic qualities of concrete and produces these improved qualities *at lower cost than by any other means.*

* *Pozzolith . . . the cement-dispersing, water-reducing agent which makes available the optimum amount of air in concrete and fully complies with the water-cement ratio law. Can be added to the mix as a powder or dissolved in water and dispensed as a liquid. Pozzolith was developed by The Master Builders Co. in 1932.*



Northrop Aircraft Plant, Anaheim, Calif.; Archt., Engr. & Contr.—Wm. P. Neil Co., Los Angeles, Calif. Pozzolith Ready-Mixed Concrete supplied by Western Concrete & Equipment Co., Los Angeles, Calif.

POZZOLITH READY-MIXED CONCRETE . . . . better, faster, in Tilt-Up Construction

Pozzolith Ready-Mixed Concrete is used extensively in tilt-up construction because it helps builders produce units faster and aids in overcoming shrinkage, crazing and cracking.

In tilt-up construction, as in all types of concrete work, Pozzolith Concrete provides these important advantages:

- EASIER PLACEABILITY — for lower placing costs
- MINIMIZED SEGREGATION — for better appearance
- REDUCED SHRINKAGE — for less cracking
- LOWER PERMEABILITY — for less "waterproofing" expense
- INCREASED BOND-TO-STEEL — for better construction
- GREATER DURABILITY — for longer life concrete

Whatever your concrete requirements, Pozzolith will enable you to obtain them *better and at lower cost* because it reduces the unit water content of the mix.

Write for full information on Pozzolith and the importance of low unit water content.

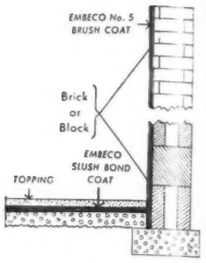
the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

Foundation Treatment

BRUSH COAT METHOD

The Embeco metallic brush coat method is an effective means for checking the passage of water through foundation walls, even when the water is under pressure. Best results are obtained by following the method illustrated below.



Embeco Brush Coat Method

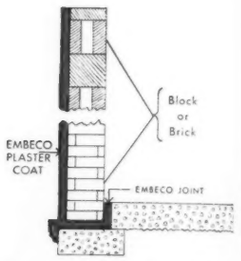
Successive brush coats of Embeco are applied to the surface — either interior or exterior — and form a tightly bonded metallic cement sheathe. This method is used for basements, reservoirs, swimming pools, elevator pits, retaining walls, sewers, tunnels, storage tanks and the like, either when installed or later.

Full directions for the use of the Embeco metallic brush coat method on haydite, cinder block, cast concrete, concrete block, soft brick, hollow tile, cut stone, furnished on request.

●

PLASTER COAT METHOD

The Embeco plaster coat method provides effective and lasting protection against water penetration for the life of the structure.



Embeco Plaster Coat Method

This method can be used either for interior or exterior application. It is particularly recommended for structures where there are known adverse water conditions.

An Embeco plaster coat is more effective than the ordinary plaster coat because it does not shrink, preventing the occurrence of shrinkage cracks. And because expansion of the metallic aggregate grains lowers porosity of the mortar.

Complete directions on the Embeco plaster coat method furnished on request.

Method For Setting Floor Brick

Non-shrink Embeco mortar is widely used to set heavy industrial floor brick, vitrified brick, deck and other types of exposed floor tile units. It counteracts shrinkage of mortar joint and dense mortar, thereby preventing seepage of moisture and corrosive liquids into mortar and between mortar and tile.

Grouting Floor Brick And "Bagging" Surface

For industrial work such as dairies, bakeries, breweries, plants and meat packing plants, use of Embeco non-shrink mortar confines corrosion to the surface, insuring long floor life. On architectural work such as verandas, terraces, roof-decks and other suspended slabs, Embeco mortar resists leakage into the structure.

Full directions on the Embeco method for setting floor brick, and for the foundation treatments referred to above, may be obtained from The Master Builders Co., Cleveland 3, Ohio.

EDITORIAL

A Safe Method for Contractors

In certain types of soil, such as water-saturated silt, clay, and similar plastic materials, wellpoint drainage is least effective. A method new to this country, designed to stabilize such troublesome soils, was recently tried with success by the Wellpoint Dewatering Corp. of New York City on a foundation for a Michigan power plant. (See photo on page 126.) This innovation, known as electro-osmotic soil stabilization, was introduced here by Dr. Leo Casagrande of Harvard University. The internationally renowned soil scientist had previously employed this unique development in Europe. Probably the most well known of the foreign projects was in Norway, where a particularly silty soil was stabilized by electro-osmosis for the construction of submarine pens during the last war.

At a recent press conference, Dr. Casagrande pointed out that the method, on which he holds various patents, can be an effective tool for contractors. While the soil expert stated that electro-osmosis is not a substitute for wellpoints, he suggested that it could be used to good effect in foundation excavations, tunnel work, and for correcting tilts in buildings, such as the leaning tower of Pisa. But above all, Dr. Casagrande emphasized that his system would result in better safety conditions for construction workers. Slides, cave-ins, shoring failures, etc., have always been serious hazards to safety in foundation, tunnel, or pipeline work in water-saturated soils. If this comparatively new tool can help eliminate dangerous situations underground, the construction industry will welcome it.

Men From Overseas

"Lean men, brown men,
men from overseas,
Men from all the outer world,
shy and ill at ease,
Bewildered by the whirl of it,
where fashion's feet go down,
Lean men, brown men,
lost in London town."

The poet was writing about the builders of Britain's once mighty empire. Change the word London to, let us say, New York or Washington, and he might be describing America's overseas construction men on a visit home. But there the analogy ends, for while these sunburned hard-muscled "construction stiffs" may be the strong silent type as individuals, they are far from being inarticulate as a group.

This foreign legion of construction workers is reported to number more than 100,000 American citizens at the present time. Though thousands of miles from home, their wants are volubly expressed through the Construction Men's Association, a voluntary membership organization with offices in New York and San Francisco. The CMA, according to its president, James H. Dillon, represents 10,800 men and women who make a lifelong career of working as construction specialists and technicians in foreign countries for American contractors. Right now the doughty Dillon is engaged on a couple of dozen fronts trying to make things a little easier for the group he represents, and to reach a better understanding with contractors. Realistically the CMA spokesman declares that his "men must help contractors make a profit to insure more work."

On the other hand he is against such things as the one-sided contract for off-continent employment; trial by foreign courts of U. S. personnel in NATO (North Atlantic Treaty Organization); double payment of income tax—both to the U. S. and to the foreign country where a man is employed—such as is now being demanded by Arabia from men working on the air base at Dhahran.

The CMA wants its men paid for holidays out of the country, the same as is done at home. Another objective is free board and lodging. A number of contractors provide these free, although most of them charge the individual $1.50 per day. "A notorious case", according to Dillon, "is the Thule, Greenland, defense base, where it is estimated that the company, which is charging 6,000 men the exorbitant rate of $5.75 per day, will make more profit from its commissary than from its construction contract".

A contented worker is generally a better worker. What these men are doing overseas is too important to jeopardize with casual treatment. Relations between contractors and workers at home are usually mutually agreeable. There should be no reason for their being otherwise overseas.

Contractors and Engineers
the BIG magazine of construction

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NEWS AND VIEWS

of the Construction Industry — Seaway, Financing, Fly-Ash

Francis V. duPont, newly appointed Commissioner of the Bureau of Public Roads, in his first Congressional appearance stated that more consideration should be given to the **distribution of Federal-Aid funds** to states. His plan would consider such factors as concentrated population and acute traffic conditions under a new distribution formula. Speaking on toll roads, he indicated that certain areas within the interstate system do not have sufficient traffic to justify a toll road. The Commissioner concluded that the Bureau's studies show no need for transcontinental superhighway facilities.

Canada has threatened to build a channel itself if the U. S. fails to join in on the **St. Lawrence Seaway project.** Under Senator Alexander Wiley's (Wis.) plan a Government corporation would be formed to build, operate, and maintain a portion of the seaway in the United States. The bill calls for a self-liquidating corporation to construct a 27-foot navigation channel past the International Rapids, and to dredge the necessary channel through the Thousand Islands section of the river. It would be contingent on Canadian assurances of completing work within its territory that the International Rapids section would be undertaken. Wiley's bill was introduced on behalf of 16 Senators and has the **green light from President Eisenhower** and his cabinet, Senate Majority Leader Taft, and General B. L. Robinson, Deputy Chief of the Corps of Engineers, U. S. Army. Strongest protests against the building of the seaway have come from U. S. railroad interests. Meanwhile, Canadians in their current "boom fever" have threatened to finance and build the seaway themselves.

In Oklahoma a toll road question may very well be the chief issue in that state's general election for 1954. As it stands now the fate of Oklahoma's expanded **toll road system** is scheduled to be determined at the ballot box unless Governor Murray calls for a special election. The bill in question calls for three toll roads. They are: (1) from Oklahoma City, Okla., north to the Kansas state line to connect with Wichita, Kans.; (2) from Oklahoma City south to the Red River to connect with Wichita Falls, Texas, and (3) the extension of the Turner Turnpike from Tulsa, Okla., northeast to the Missouri state line to connect with Joplin, Mo.

Michigan's Mackinac Bridge project appears to be shelved again for lack of support from the bond market and the Michigan legislature's refusal to appropriate funds to maintain the bridge. Nevertheless, a helpful shot in the arm could be forthcoming if a bill is passed proposing a public referendum for $100,000,000 in general obligation bonds.

The plan for the construction of a power plant for the **Chief Joseph Dam** in Washington State is up in the air again following the United States withdrawal of bids. Britain informed the U. S. that rejection of a **low British bid** in connection with the dam was considered a bad omen for the future foreign trade policy of the Eisenhower Administration.

Discussing the future role of the Federal government in road building are, left to right, Hon. George H. Fallon (Md.), ranking minority member of the House Subcommittee on Roads; Gen. Eugene Reybold, Executive Vice President, American Road Builders' Association; Hon. George A. Dondero (Mich.), Chairman, House Committee on Public Works; Francis V. duPont, Commissioner, Bureau of Public Roads; and Hon. J. Harry McGregor (Ohio), Chairman, House Subcommittee on Roads.

In two unique methods the Dutch and Indian governments are meeting with success in their repair and building programs. The Dutch used a model of the Dutch Rhine delta which simulates tide and wind factors to study the methods they would use in repairing their broken dikes. It enabled engineers to gain the know-how in what to expect from the elements. The Dutch, following two weeks of practice with the model, eased a huge caisson into place by tugboats. At the precise moment between ebb and flood tide they scuttled it, thus closing the first big gap in **Dutch sea defenses**—a 175-foot hole in the dike near Hellevoetsluis on the island of Voorne. The 180-foot model has been in operation for 15 years, but the February floods have given it an importance that none had expected. A progress report on the flood repair listed as dry again 330,000 out of an original 360,000 inundated acres.

In India elephants are being booked for road building. The Assam State government is using elephants to compact and level earth roads. Statistics reveal one elephant can do the work of 20 to 30 men using tampers and rollers. They are also used to drag timber, plow, and harrow in other areas.

The New York City Council was in the news following its approval of a law permitting the use of **fly-ash,** a waste product of powerhouse boilers, in controlled concrete. Fly-ash was defined in the amendment as "the residue from burning pulverized coal in suspension which is separated and collected from the gases of combustion after they leave the furnace." It is caught by electrostatic precipitators and other devices.

Another plan, a dream of highway engineers for an **ice and snow-free road,** was short-lived when highway research project engineers at the Massachusetts Institute of Technology recently tested a new concrete additive invented by a German technician. According to the tests the additive had no effect in the melting away of ice and snow.

An issue of $75,000,000 in revenue bonds for the refunding and **extension of the Maine Turnpike** has been placed on the market. The 4-per-cent bonds are for the construction of 66 miles of new expressway—a 9-mile Portland by-pass and a 57-mile extension to Augusta. The highway now runs from Kittery to Portland, a distance of 47 miles. Of the proceeds, more than $19,000,000 will be used to retire outstanding bonds.

Sketch by Eggers & Higgins, Architects, of the State University of New York's new $14,500,000 Basic Sciences Building at the Downtown Medical Center in Brooklyn. Cauldwell-Wingate Co., New York, N. Y., the general contractor, started construction this spring. The 11-story, 3-block-long building is expected to be completed in 1955, and will house one of the country's largest colleges of medicine.

Ralph Monson, a new Field Editor of CONTRACTORS AND ENGINEERS.

C&E Adds Ralph Monson To Editorial Staff

CONTRACTORS AND ENGINEERS is pleased to announce the appointment of Ralph Monson of Rochester, Minn., as a Field Editor. Mr. Monson received a civil engineering degree from the University of Minnesota, and during his senior year was Editor-in-Chief of the engineering publication *The Minnesota Techno-Log*.

After graduation, he served nearly ten years in various positions on the engineering staff of the St. Paul, Minn., Department of Public Works, and has been City Engineer of two Minnesota cities, South St. Paul and Rochester.

Mr. Monson is a member of the National Society of Professional Engineers, and the American Public Works Association. He is on the Executive Committee of the League of Minnesota Municipalities, is President of the Minnesota Public Works Association, and a former President of the Kiwanis Club of Rochester, Minn. He is well known throughout Minnesota for his activities in public works affairs.

He will cover territory in the midwest for CONTRACTORS AND ENGINEERS from his headquarters in Rochester, Minn., where he resides with his wife and two sons. C&E's roving editorial staff also includes Bill Quirk, Ray Day, Al Smith, and L. H. Houck.

Manages Finances for N. Y. Thruway Authority

Daniel J. Langan, of Kinderhook, N. Y., has been appointed Director of the Division of Finance and Accounts on the staff of the New York State Thruway Authority. His duties, which will cover many aspects of financial planning, will include budgeting, accounting, and auditing. He will coordinate the Authority's investments and borrowings with the State Comptroller's office.

Mr. Langan brings 20 years' experience to his new job. He began work as an accountant in a New York City firm in 1928, and later joined the Mortgage Commission of the State of New York where he became Comptroller. In 1943 he was appointed Principal Research Analyst in the State Division of the Budget, and was Principal Budget Examiner until his recent appointment.

Let's roll up our sleeves today and give to the Red Cross Blood Bank.

Allied Officers Program

More than 30 high-ranking engineer officers from 14 nations met in April at the Engineer Center at Fort Belvoir, Va., to study the organization, equipment, and procedures of the Corps of Engineers, U. S. Army. The conference was part of the program for training Allied officers in service schools in the United States, and was designed to present an overall picture of the Engineer Center's operations from the reception of newly inducted men to the graduation of experienced field grade officers. The group also saw representative field work in the Upper Mississippi Valley and North Atlantic Divisions of the Corps of Engineers.

Nations represented were: Belgium, Canada, Denmark, France, Greece, Iran, Republic of Korea, Nationalist China, the Netherlands, Norway, Portugal, Thailand, Turkey, and the United Kingdom.

Builders Elect Officers

At the annual dinner of the Metropolitan Builders Association, the New York Chapter of the Associated General Contractors of America, Col. Charles A. Selby, Vice President of Vermilya-Brown Co., Inc., was elected President of the Association.

Re-elected for another term in their respective offices were: Philip Grove, First Vice President; Neil Horgan, Second Vice President; Wm. Josha Barney, Jr., Secretary; and John D. Hageman, Treasurer.

Elected to the Board of Governors were: H. C. Turner, Jr., Alfred Rheinstein, Alfred E. Budell, I. Roy Psaty, and C. P. Street.

Mr. Street, National President of the AGC, predicted an active construction year.

Bock Heads Puerto Rico Water-Power Authority

Carl A. Bock has been appointed Executive Director of the Puerto Rico Water Resources Authority, San Juan, Puerto Rico, by the Board of Directors of the Authority.

Formerly Director of Engineering for the Tennessee Valley Authority, Mr. Bock has been associated with the development of Puerto Rico's water resources since 1935. As Chief Engineer of the PRWRA he enlisted the interest of the U. S. Geological Survey in speeding up mapping of the island.

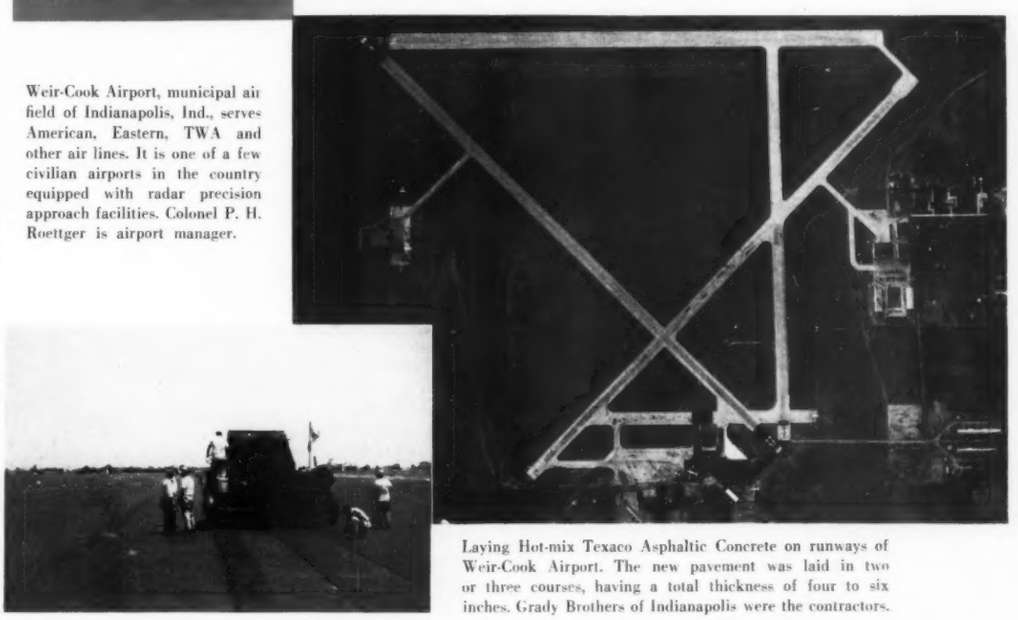
The Caonillas hydroelectric project, as well as the Caonillas Extension with four dams and two hydroelectric power plants, were built under Mr. Bock's direction. He was also in charge of San Juan's modern 80,000-kwh steam electric-generating station.

"Constellations" and "Cubs" now land on resilient Texaco Asphaltic Concrete

Weir-Cook Airport

INDIANAPOLIS

Weir-Cook Airport, municipal air field of Indianapolis, Ind., serves American, Eastern, TWA and other air lines. It is one of a few civilian airports in the country equipped with radar precision approach facilities. Colonel P. H. Roettger is airport manager.



Laying Hot-mix Texaco Asphaltic Concrete on runways of Weir-Cook Airport. The new pavement was laid in two or three courses, having a total thickness of four to six inches. Grady Brothers of Indianapolis were the contractors.

Weir-Cook Airport at Indianapolis is one of the midwest's major air terminals, with 16,000 aircraft movements a month by planes of every type, from heavy Constellations to Piper Cubs. It is a main port of call for American, Eastern, TWA and other important air lines.

During 1952, this airport's officials carried through an extensive resurfacing program affecting large sections of the runway system, as well as taxiways and aprons. Two or three courses of hot-mix Texaco Asphaltic Concrete, from four to six inches in total thickness, were laid over the existing concrete pavement. Graded gravel, partially crushed, and an 85/100 penetration Texaco asphalt were the ingredients used to provide the dense, durable, resilient Asphaltic Concrete surface. A seal coat of emulsified asphalt, covered with white stone chips, completed the new paving.

For major airports like Weir-Cook, as well as for primary highways and busy city streets, hot-mix Texaco Asphaltic Concrete is the ideal heavy-duty pavement. Its ability to absorb punishing impact, freedom from joints, immunity to ice control chemicals and low susceptibility to temperature changes insure many years of satisfactory service at low upkeep cost.

Today, more than ever before, it is essential that a maximum return be obtained from paving dollars. You take an important step in that direction by including Hot-Mix Asphaltic Concrete in specifications for heavy-duty paving. Helpful information regarding this and the various other types of Asphalt construction is supplied in two booklets, which our nearest office will be glad to send you.

THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17

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TEXACO ASPHALT

Engineers Choose Seven Wonders

The New York Metropolitan Section of the American Society of Civil Engineers has voted George Washington Bridge the outstanding "engineering wonder" in the metropolitan area.

George Washington Bridge, 3,500 feet long and spanning the Hudson River between 178th Street, Manhattan, and Fort Lee, N. J., was the longest suspension bridge ever built at the time of its completion and is now second only to the Golden Gate Bridge of San Francisco which has a 4,200 foot-span.

The seven "engineering wonders" as voted in the order of preference were: George Washington Bridge, Brooklyn Bridge, Empire State Building, New York City Subway System, New York Water Supply System, Holland Tunnel, and Brooklyn-Battery Tunnel. Runners-up, in the order of choice, were the United Nations Building, Rockefeller Center, Grand Central Terminal, Parks and Parkways, Docks and Piers, and the New Jersey Turnpike.

A view of George Washington Bridge, looking toward Manhattan. The American Society of Civil Engineers, New York Metropolitan Section, voted this structure the foremost engineering wonder in the Metropolitan area.

The Metropolitan Section includes Greater New York, Long Island, Westchester County, Rockland County, and northern New Jersey.

Many members who gave reasons for their choice favored George Washington Bridge because it was the longest suspension bridge in the world at the time of its opening on October 25, 1931, as well as for its magnitude, beauty, and usefulness. The bridge, built and operated by the Port of New York Authority, is 4,760 feet long between anchorages, while the length of the bridge and approaches, including the tunnel to Amsterdam Ave., Manhattan, is 11,130 feet. Width of the bridge is 124 feet and width of the roadway 90 feet. The traffic volume in 1952 was 27,979,213 vehicles.

The "Seven Wonders" of ancient times were the Pyramids of Egypt, Hanging Gardens of Babylon, the Phidias Statue of Zeus, Temple at Ephesus, Tomb of Mausolus, Colossus of Rhodes, and Pharos Lightship at Alexandria. All except the Pyramids have been destroyed.

LIFT IT
and compare weight. None lighter—none more balanced.

a challenge to every construction man . . . take this

CLINTON CHAIN SAW
3 MINUTE
CONVINCER TEST

PRICE IT
and compare cost. Lowest price in its power class.

YOU'LL BE CONVINCED HERE'S THE QUICKEST STARTING, EASIEST OPERATING, MOST RELIABLE CHAIN SAW . . .

Clinton Convincer Chain Saws *really* prove themselves when out in the bush, taking any timber stand in stride—giving unfaltering service day after day on the job.

But Clinton believes this! You must decide for yourself about the new Clinton Convincer Chain Saw. And this 3-minute test is all you need to make up your mind. No long-winded sales talk! No looking but not touching. You must try Clinton! LIFT IT and compare weight—USE IT and compare performance—PRICE IT and compare cost. Clinton is the only Chain Saw manufacturer that dares you to compare.

You're going to see a rugged, hard-working chain saw in action. You'll be seeing a chain saw that adds materially to your profits through power, versatility and the kind of long service that means more board feet cut every day.

See your Clinton Dealer for your free 3-Minute Clinton Chain Saw Convincer Test. Or mail the coupon below and we will send your free literature and make arrangements with your local dealer to contact you.

Same Day Service on your Clinton Chain Saw anywhere in the nation. Nearly 4000 Parts and Service Centers.

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and compare performance. Rugged—powerful—versatile.

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Yes, I'm interested in taking the 3-Minute Clinton Convincer Chain Saw Test. Send me the name of my nearest dealer and free literature.

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Address_____
City_____
State_____

Highway Statistics 1951

The Bureau of Public Roads, U. S. Department of Commerce, has issued a pamphlet—the seventh of an annual series—presenting the 1951 statistical and analytical tables of general interest on motor fuel, motor vehicles, highway-user taxation, financing of state and local highways, highway mileage, and Federal aid for highways.

"Highway Statistics 1951" calls attention to information of interest or significance, supplies definitions of terms used in the tables, and points out limitations of data presented.

The pamphlet may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., for 60 cents.

Fisher Opens Department

An industrial relations department, which includes a full-time safety program, has been opened up by Fisher Contracting Co., Phoenix, Ariz. Manager of the department is Jack Grady, formerly Associate Secretary of the Industrial Council, Inc., Phoenix. Ray Wells, formerly of the Water Users Power District Safety Department, is Director of the safety office.

Responsibilities of the new department include public relations, union relations, and recruiting and interviewing employees.

Grace Schaeffer is Mr. Grady's staff assistant.

N. J. Road Chief Injured

Ransford J. Abbott, New Jersey State Highway Commissioner, was confined to the Burlington County Memorial Hospital, Trenton, after a grade-crossing accident on the evening of May 18.

Mr. Abbott is also Chairman of the New Jersey Highway Authority which administers the Garden State Parkway.

Names in the News

R. C. Wietersen, President of the Internal Combustion Engine Institute.

Wietersen Is President

R. C. Wietersen, Director of Purchases for the Buda Co., Harvey, Ill., has been elected President of the Internal Combustion Engine Institute, whose membership includes the major manufacturers of high-speed gasoline and diesel engines.

Further officers elected at the Institute's annual meeting were: J. E. Heuser, Sales Manager, Engine Division, Le Roi Co., Milwaukee, Wis., as Vice President; R. H. Kerr, Chief Engineer, Climax Engine & Pump Mfg. Co., Clinton, Iowa, as Secretary; and J. D. Cook, Secretary and Treasurer, Hercules Motor Corp., Canton, Ohio, as Treasurer.

ASCE Award for Praeger

The Metropolitan Section of the American Society of Civil Engineers has announced the selection of Emil H. Praeger as Metropolitan Engineer of the Year. Mr. Praeger won distinction in World War II for the original design of concrete floating breakwaters in the Normandy invasion. This new recognition is for his concept and design of Pier 57, Hudson River, New York, N. Y., which contains many new features. Of special interest is the use of three reinforced-concrete boxes as the substructure for the pier, which carry much of the dead weight of the structure and can at the same time be put to many uses.

Mr. Praeger is a principal in the consulting - engineering firm of Praeger & McGuire, 126 E. 38th St., New York City.

Edwin A. Pasha Elected Vice President of M-C&S

Edwin A. Pasha, a member of Merritt-Chapman & Scott Corp. since 1940, has been elected Vice President in charge of the company's Industrial and Building Construction Division.

In his new post, Mr. Pasha will be responsible for several Merritt-Chapman & Scott works now in progress, including the paper-mill projects in Georgia, Fla. and Hadera, Israel, and chemical-plant installations in Delaware and Virginia. Most recently Mr. Pasha served as manager on the construction of an air base being built in Canada.

Robert R. Brooks Elected

At a recent meeting of the Circuit Judges and the Acting Mayor of the City of St. Louis, Mo., Robert B. Brooks, Consulting Engineer, St. Louis, was elected to membership on the St. Louis Board of Freeholders for the Metropolitan Transit Authority. The Board is engaged in a study of mass transportation as well as motor vehicular traffic in St. Louis' metropolitan area. Within a year the Board will submit its findings to the people of St. Louis, who will vote on the proposed plan.

Ax Joins Vollmar Bros.

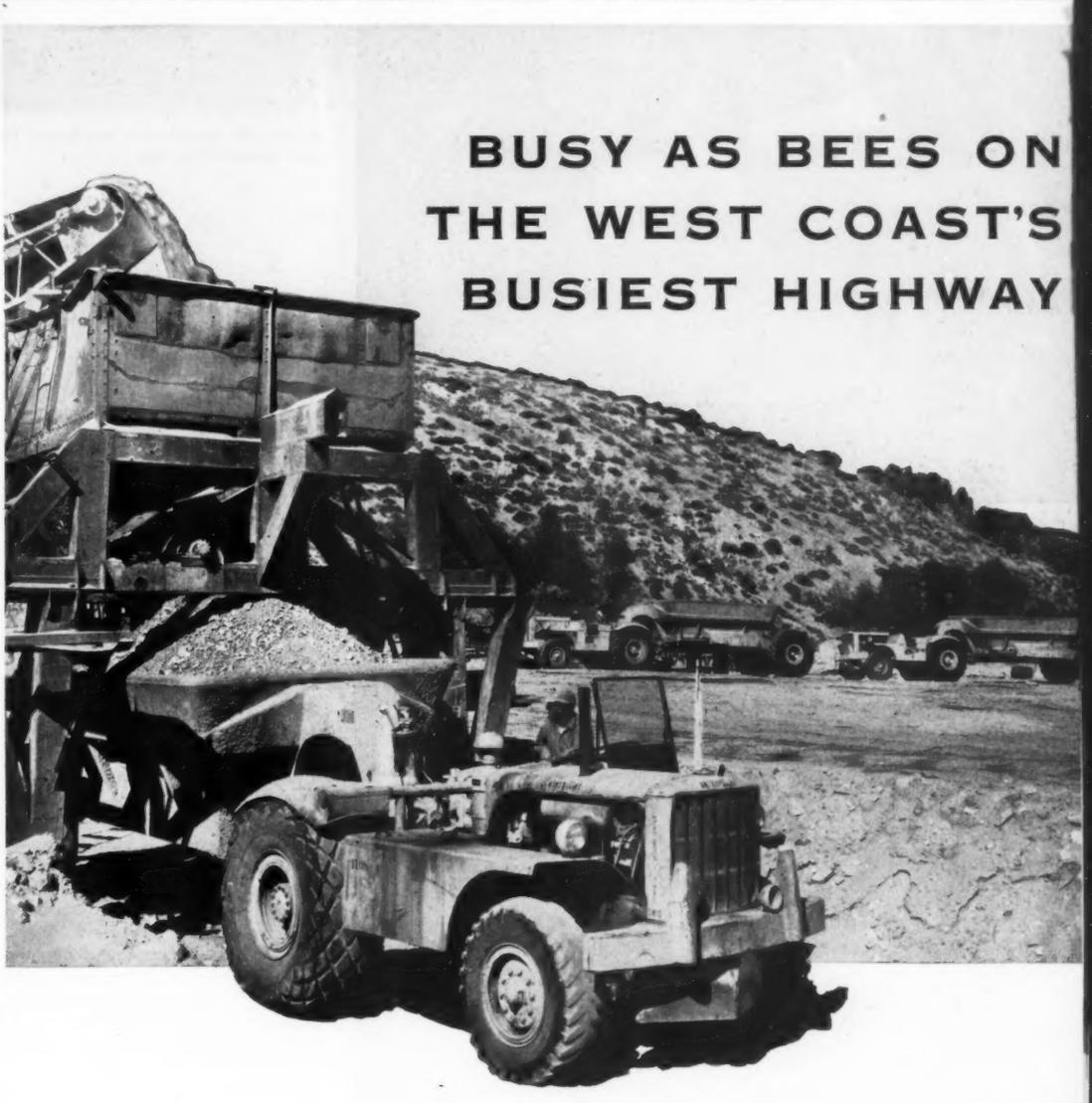
Clarence H. Ax has joined the staff of Vollmar Bros. Construction Co., Victor St., St. Louis, Mo.

Mr. Ax has been active in the construction and engineering fields for 22 years. During World War II he served with the Corps of Engineers, U. S. Army. He is a vice president of the St. Louis section of the American Society of Professional Engineers.

B. A. Lefeve Receives Permanent Appointment

Bernard A. Lefeve has been appointed to the permanent position of Director of the Bureau of Highway Planning, New York State Department of Public Works, a post which he has held provisionally since 1951.

Mr. Lefeve will continue to direct the functions of the Bureau of Research and Statistics, and serve as Chairman of the Civil Defense Committee of the State Department of Public Works. During World War II, he served in the Army as Post Engineer.



Caterpillar DW10 Tractors and W10 Wagons were the logical choice of N. M. Ball & Sons to build 11½ miles of four-lane divided highway from Gorman to Lebec, California.

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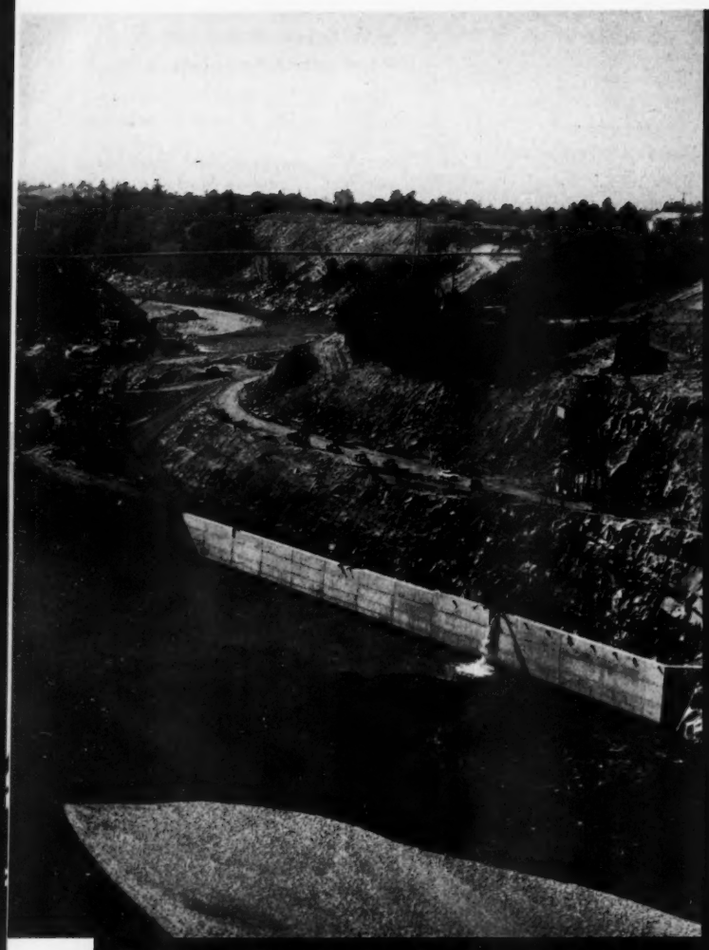
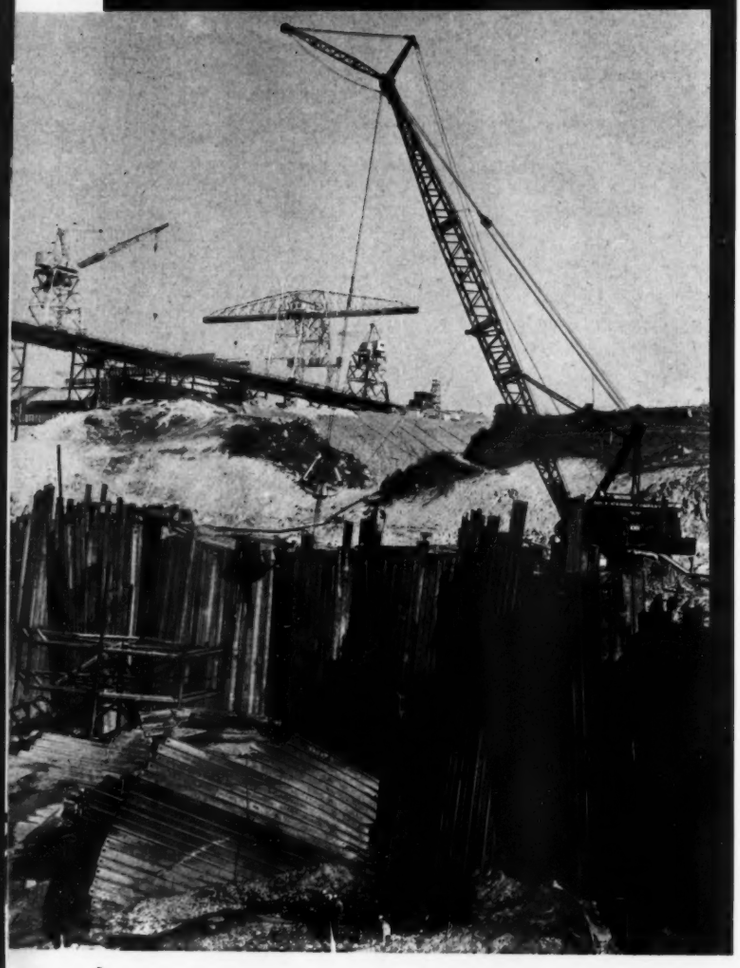


Looking downstream *(above)* at the damaged cofferdam for the powerhouse to be located at the foot of the dam on the river's right bank. A Bucyrus-Erie 54-B *(below)* clams out flood-damaged cellular pile cofferdam, built for powerhouse construction.



A P&H 1055 shovel loads a bottom-dump Euclid with gravel to be used for intermediate zone material in the dam.

Folsom Dam

Structure for Flood Control And Power in Over-All Plan

• ON the American River, about 20 miles east of Sacramento, Calif., a comprehensive river development plan is in the making. Folsom Dam, the key unit in this plan, is now under construction. Built by the Corps of Engineers, U. S. Army, its powerhouse and post-completion operation will be a function of the U. S. Bureau of Reclamation. Folsom Dam is the result of the first close-working partnership between these two agencies, and as such exemplifies the "Folsom Plan" stream-development formula.

The present contract for the dam, also including several earth dikes, along with two pumping plants and appurtenant work, is being done under a joint venture by two contractors: Merritt-Chapman & Scott Corp., New York, and Savin Construction Corp., Hartford, Conn.

Construction is scheduled along the usual pace for that type of work, and Savin's contract, which began in November, 1952, is scheduled for final completion by January, 1955. By that time, Guy F. Atkinson Co., South San Francisco, Calif., builder of the Folsom Dam Powerhouse for the USBR, is also likely to be finished, and another key structure in a great river can go to work for the good of humanity.

Comprehensive Stream Plan

The American River of the future will flow down from the crest of the Sierra range as a mild-mannered stream, whereas in former years it rushed through the foothills with a fury of over 200,000 cfs, especially during the wet winter season. Year after year, the river has discharged a volume of over 2 650 000 acre feet of water. The problem is how delivery is made to the valley floor.

The solution is the control and regulation of that delivery so as to reduce flood hazards, and at the same time provide water for irrigation and the production of hydroelectric power. Folsom Dam is a major unit in this solution.

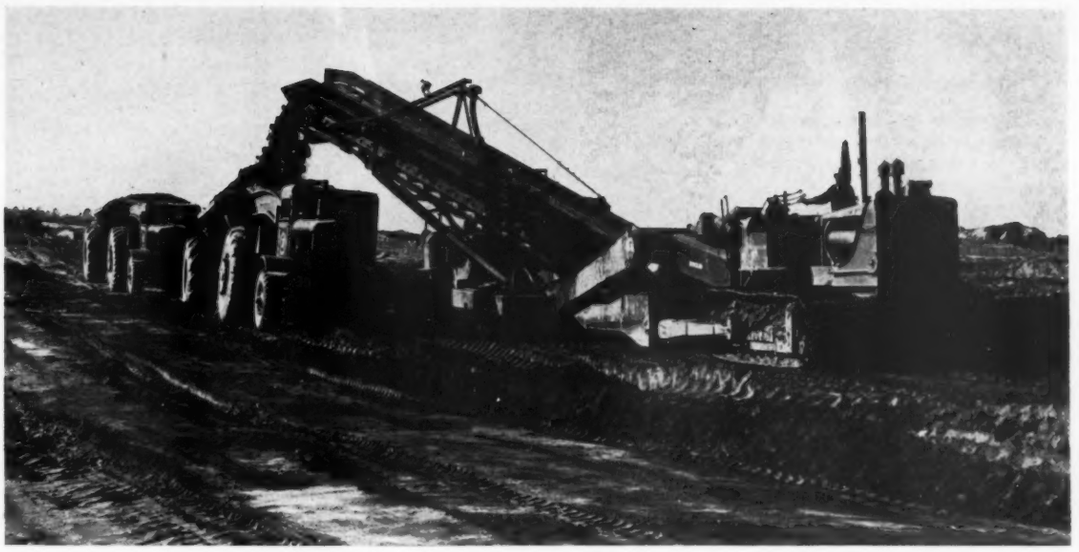
This great multipurpose development will harness the erratic flows of the American River, and will provide in the West the benefits which water is capable of giving, through a system of dams, canals, and power plants on the main stem of the river and its tributaries. Folsom Dam, on the main stem, is a key unit in this system.

First stages of the development were authorized as a flood-control project in December, 1944, by the 78th Congress. It was subsequently re-authorized in its present form as a part of California's Central Valley Project by the 81st Congress. Eventual full development of the stream's resources will be covered by the same enactment which provided for studies of canals, additional upstream storage dams, and more power plants.

Completion of the first stages will make available enough irrigation water for 200,000 acres of land in Sacramento, El Dorado, Placer, and northern San Joaquin counties. It will bring a power capacity of 175,000 kw to California's growing industrial and farm economy. So far as Folsom Dam is concerned, it will virtually eliminate fear of floods in the rapidly growing suburban areas of Sacramento, and in the lower Sacramento River Valley.

(Continued on page 14)

By RAY DAY



A Euclid 10BV loader, handled by a pair of Allis-Chalmers HD-20 tractors, loads a fleet of bottom-dump Euclids.

Checkrein on the American River

River Diversion, Excavation and Fill Are Part of Big Contract

• THERE are many supporting operations at Folsom Dam, each of which would make a sizable contract in itself. In spite of the fact that Folsom is concrete, many of these supporting activities are necessary to create a dam site. These supporting activities include the removal of Pacific Gas & Electric Co.'s old dam just below the present structure, a river diversion with the help of cofferdams and a tunnel, an enormous cleanup job from the disastrous January flood of 1953, and an excavation and fill job that totals something like 14,000,000 cubic yards.

Smaller jobs are handled as sidelines.

Old Powerhouse Removed

Below the present structure, at the town of Folsom, Pacific Gas & Electric Co. in 1895 built Folsom Dam and Powerhouse. For many years this old structure served the community, but when the bigger "Folsom Plan" was inaugurated under the auspices of the Corps of Engineers, U. S. Army, and the U. S. Bureau of Reclamation, something had to give, and there was no room for anything that was old.

The old masonry is being removed with the help of explosives, so that the future tailrace channel below the new powerhouse will have a clean raceway as the water escapes down the river.

Removal of the old dam was a wagon-drill job, pure and simple. In spite of the fact that the concrete techniques of 1895 were supposedly not as far advanced as they are now, it was necessary to use tungsten carbide bits to even touch this material with anything like good efficiency. Twenty-four-foot drill steel was used, and the holes were put down on a grid of 3-foot centers. They were then column-loaded with 40 per cent gelatin-type Hercules powder, and the masonry was shot.

Demolition operations stopped in 1952, considerably short of the complete removal of the old dam. Enough masonry was left in to prevent the escape of too much valuable stream gravel, which is furnishing part of the material for the embankments. As the 1953 construction season gets further along, the remainder of the old dam will be broken out by the same drill and blasting methods, and eventually will be gone entirely.

River Diversion Methods

The stream-diversion method used by the builders of Folsom Dam makes use of a 23-foot-diameter horseshoe-shaped tunnel 1,470 feet long, which was driven and lined under a previous contract with T. E. Connolly, Inc., San Francisco, Calif. This tunnel passes deep through the right abutment, and will pick up the river at its normal elevation of plus 200.

For the first-stage diversion, rock and earth dikes were built upstream and downstream from the main foundation area. Both cofferdams were dumped across the river in the form of large dikes. The upstream cofferdam, for example, carried a 35-foot roadway, had 1 to 1 side slopes, and was built to an elevation of 250 feet. The downstream cofferdam was built to a 220-foot elevation (referred to sea level). These structures forced the American River into

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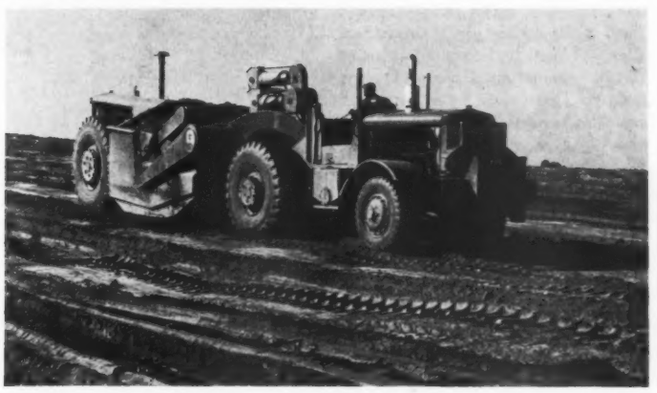


No pushers are needed in loading as this Euclid Twin-Power scraper picks up a load of impervious material.

This Porter 50-ton Super-Compactor, pulled by an Allis-Chalmers HD-19 tractor, compacts the impervious center-zone material in the dikes.

An Adams 610 motor grader blading uphill.

Folsom Dam Contract: Details and Methods

(Continued from preceding page)

the diversion tunnel, and prevented backwater at the point of emergence from the lower end of the tunnel from re-entering the work area.

These cofferdams were erected with the help of power shovels and hauling equipment, later used for the construction of dikes and other earthen structures supporting the basic concrete dam proper.

With any luck at all, this method of river diversion would have sufficed long enough to clean the foundation and build the first concrete monoliths up to an elevation of 230 or 240 feet. As if it recognized man's attempt to place a muzzle on its unique type of hydraulic freedom, the American River on Friday, January 9, went on a rampage. By 7 p. m., 25,000 cfs snaked downstream and battered hard against the upstream cofferdam. A pool had formed, covering the diversion-tunnel portal.

Savin Construction Corp.'s crews had half expected trouble, so by the time the river reached this point, all major construction equipment owned by the company had been moved up from down below. Trouble began to develop with a slow seep along the solid rock sides along the right bank, where the abutment met with cofferdam material.

At first there was a seep, then a shallow trickle, and then a stream began to widen. Alarmed construction stiffs, high on the concrete trestle where the gantry and hammerhead cranes were mounted, saw the danger, and some wise man went out to the end of the trestle and ordered the Washington revolving crane moved in as far as it would go. His order came not a moment too soon, for suddenly the battering force of the river proved too much, and the upstream cofferdam began to disintegrate rapidly.

In a matter of minutes, a hole 50 feet wide had been battered through, and the river poured with flood force down into the construction area. The first wall of water practically tore out two bents of the high structural steel trestle, upon which cranes and men had been standing only minutes before. Collapsing with a terrific crash, it fell into the river, leaving the cranes standing safely inshore.

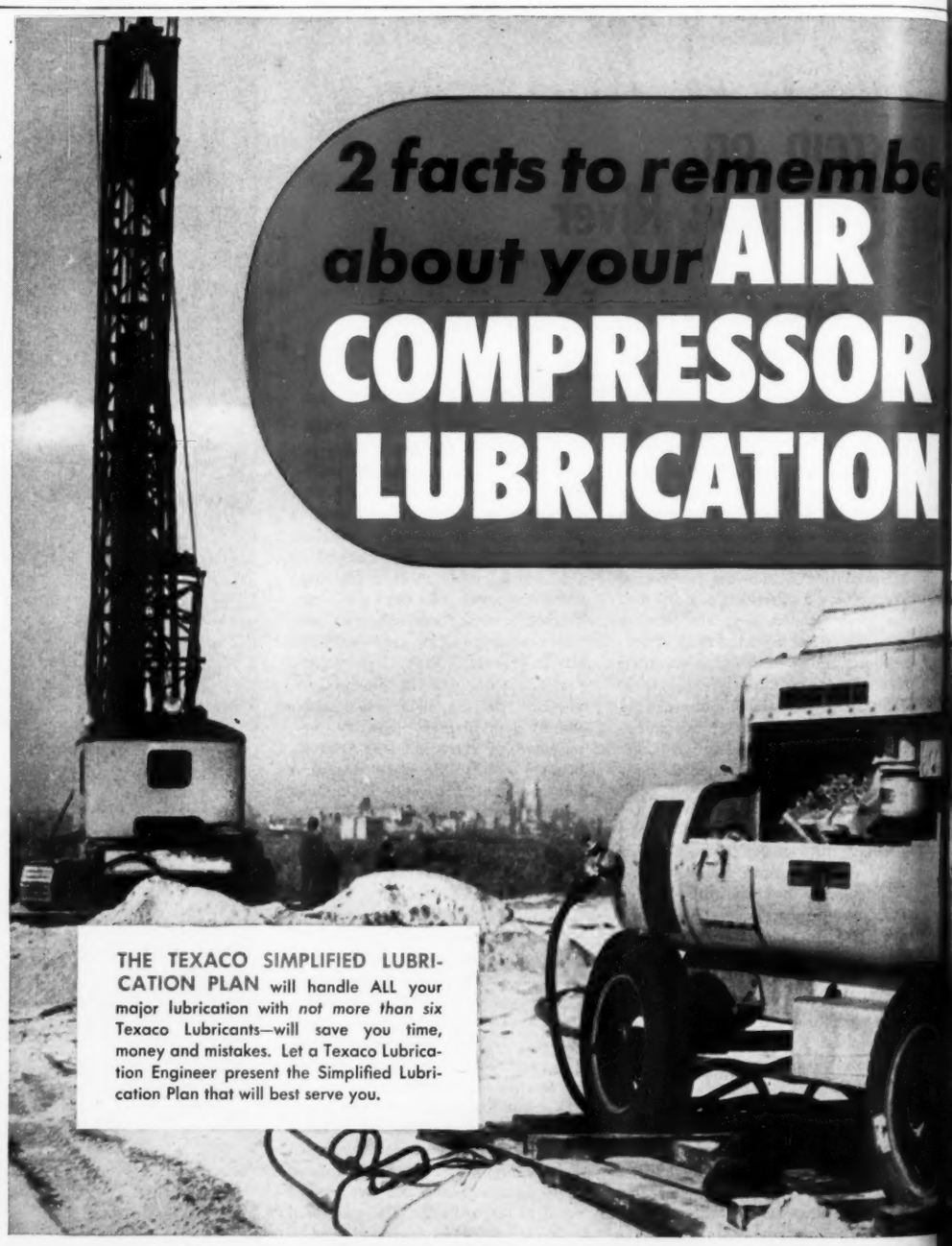
The flood roared on downstream, ripping out the cofferdam there, and overtopping a steel cellular protective cofferdam Guy F. Atkinson Co. had erected, while crews of that company made the deep excavation for the USBR powerhouse. Atkinson was not so fortunate. Considerable light equipment and one piece as large as a truck crane were lost. Steel-sheet piles in the cellular cofferdam collapsed under the rushing force of the water, and fell over into the powerhouse area. The excavation site soon sanded in with debris, sand, and gravel.

The main Folsom Dam site, where Savin's crews had worked laboriously for months to clean the foundation and place the first concrete, also filled in. The river continued to roll unchecked, until it fell some days later.

Atkinson's crews began almost immediately to re-establish steel cell pile cofferdam work, but Savin's crews held off for the rest of the rainy period, hoping to resume work in April. Plans for early 1953 include the re-establishment of both cofferdams, a general cleanup phase over the dam foundation, and a resumption of concrete work to bring that masonry up to an elevation great enough to be out of danger by the end of this year.

Second-stage diversion will consist of the closing of a gated opening in the tunnel, and the permanent plugging of that structure with a 500-foot block of concrete. At the same time the cofferdam will be removed, and the river will then flow through the eight permanent outlet openings in the concrete portion of the structure. Four of these openings are at elevation 210; four at 280.

Euclids roll along the main haul road leading up to the earth section of the dam.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CONTRACTORS AND ENGINEERS

Massive Earthwork Quantities

In view of the fact that Folsom is a concrete dam, the amount of earth handling is enormous. Savin's job includes all the remaining earth dikes, which in addition to those built previously will round out a watertight barrier stretching nearly 5 miles over the wide river valley. In addition, there is considerable "dental excavation", which will pick off the last few feet of weathered foundation rock from previously stripped abutments.

There is structural excavation for the North Fork Pumping Plant on the west bank of the river, as there is for the Natoma Ditch Co. pipe line on the east bank. Excavation was necessary for the construction of a temporary water-supply ditch to Folsom Prison, and wherever the visitor looks, he can see many types of excavating equipment at work.

All in all, about 14,000,000 cubic yards of excavation handling lies ahead of Savin's forces between now and the completion date of the project. When Savin moved in, about 4,000,000 cubic yards had already been placed under a previous contract at Mormon Island, and 1,000,000 cubic yards had been placed in dikes similar to the ones in Savin's contract.

Machines Reflect Work Type

The selection of excavating equipment and hauling units accurately reflects the many types of work Savin will grapple with as the excavation job proceeds. Materials-loading equipment includes a Euclid 10BV loader, a Marion 111-M power shovel, a P&H 1055 shovel, a Bucyrus-Erie 54-B, 3 Northwest 80-D's, a Manitowoc Model 4500 5-cubic-yard dragline, a Lorain 820 dragline, and other allied equipment like 2 Lorain 504-M truck cranes and 1 Lorain 50 backhoe.

Hauling units include fifteen 31FTD Euclid rear-dumps, rated at 16.4 cubic yards; fifteen 18LFTD Euclid bottom-dumps rated at 26 cubic yards; three 43FTD Euclid bottom-dumps rated at 13.7 cubic yards; 3 Model 800 Heiliners rated at 16.8 cubic yards; and a fleet of 10 Mack dump trucks which were picked especially for the transportation of aggregates from the rock production plant to the river crossing. Auxiliary equipment working with these machines includes 3 International TD-24's, 4 Allis-Chalmers HD-19's, 3 Allis-Chalmers HD-20's, a fleet of 8 Caterpillar D8's, 2 Caterpillar No. 12 motor graders, and an Adams 610 machine. Two Porter 50-ton Super-Compactors are on the job.

The sizable outlay of water truck equipment, Rainmaker pipe, Rex and Jaeger pumps and so on, necessary for moisture control, is also very much in evidence, but that equipment belongs to Burgan & Stevens, who are furnishing water to Savin under a subcontract arrangement. Savin also has a considerable amount of rock equipment. There are 3 Joy 630-cfm compressors, 2 Ingersoll-Rand 600-cfm machines, 12 wagon drills of many makes, numerous jackhammers, and even a large Ingersoll-Rand Quarrymaster drill, which will be used to finish out the foundation excavation.

As an additional source for some of the construction air, 5 big air compressors are mounted in the aggregate-cooling building. These machines include a pair of Joy 615's, powered by 150-hp Allis-Chalmers motors; and 3 Joy 1,895-cfm machines, each powered by 300-hp Allis-Chalmers motors.

Any dirt man well versed in the selection and use of excavating equipment can well visualize from this list the several types of work Savin is doing. There is rock loading, both in connection with foundation and abutment stripping, as well as the production of riprap for the outer protective zone of the dam, particularly on the dike sections. The bulky intermediate zones of all the auxiliary dikes are made up of ordinary river-run gravel, so this phase requires the use of the power shovels and some of the hauling units. The impervious core of the earthen structures consists of a peculiar type of decomposed granite, which is available on both banks of the river, and which can be loaded in machines like 4 Euclid Twin Power scrapers and a Caterpillar DW20, which also are on the equipment roster.

The large crawler tractors assigned to the equipment fleet are there for use as dozers, for smoothing intermediate zones, for spreading dumped riprap. An indication as to how well the equipment would perform was shown in some of the very first phases of the work.

For example, early in the job a toe trench was dug across the full length of the dam. Its purpose was to serve as a permanent drain. The width at the top of this ditch was approximately 40 feet. Its depth depended entirely upon the material, and the location along the toe of the dam. The Marion dragline was used for this excavation with two Euclid 31TD's of the quarry type. On this operation, each Euclid received seven passes from the dragline and all the earth and rock was then hauled 890 feet to a dump. A round trip of 1,780 feet took an average of 4.3 minutes.

The early cleanup operations were illustrated by a spread which worked along the edge of the river bed at the base of the dam site. This spread included a Northwest 80-D diesel shovel, which worked with 3 Euclid Model 31TD's, 2 of which were quarry type, and 1 standard type. This material was mostly large pieces of blasted granite rock, with some earth. The shovel loaded 5 passes into each "Euc", which then hauled up a 10 per cent-average grade for approximately 1,800 feet, where it dumped over an embankment at Dump No. 2. The 22-ton units were averaging between 160 and 180 trips per 10-hour shift.

(Continued on next page)

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Folsom Dam Contract: Details and Methods

(Continued from preceding page)

A temporary canal was dug by 2 draglines: a Bucyrus-Erie 54-B with a 2½-yard Esco bucket, and a 5-yard Manitowoc. Designed for emergency use to divert the river, and incidentally to provide water for Folsom Prison while the dam is under construction, the canal was 100 feet wide at the top, 40 feet wide at the bottom, and 35 feet high. It was approximately 3,000 feet long.

On this work, the 2½-cubic-yard 54-B dragline was working with 4 Model 31TD Euclids. Each truck took 5 passes from the dragline. The material was a mixture of muck and washed river rock and gravel weighing approximately 3,200 pounds per loose cubic yard. The haul extended up an 18 per cent grade for 1,500 feet, while the actual dump was within the Folsom Prison grounds. During each 10-hour shift, these 4 Euclids averaged 5 trips per unit per hour. In this same area, the 5-yard Manitowoc dragline was loading a group of 8 Model 31TD Euclids. The materials, haul road, and dump were the same. In this case, each Euclid took 2 passes per load. The production was the same as, with the fleet of 8 Euclids, the Manitowoc turned out 400 loads per 10-hour shift.

Another operation studied was an excavation in the main channel, where a Marion 111-M 4-yard shovel was working with a fleet of 7 Model 18LDT Euclids of the belly-dump type. The material was washed river gravel, which was hauled to the wing dams for fill in the pervious sections. In loading, each unit took 7 passes from the shovel in an average time of 2.25 minutes. The remaining haul, dump, and return time totaled an average of 8.50 minutes, making a total cycle time of 10.75 minutes. On this operation, the haul was over good roads, and was broken down into three sections: 0.3 mile of 4 per cent grade from the borrow pit to the far side of the river (a bridge crosses the diversion-tunnel outlet); 0.3 mile of 8 per cent grade up the far bank; 0.6 mile of 3 per cent grade onto the fill area of the wing dam where the gravel was dumped. The fill was spread and compacted in 12-inch lifts by an Allis-Chalmers HD-20 tractor and dozer. An excellent over-all production was being made here.

Another typical operation consisted of 4 Twin Power Euclid scrapers, which were working with a Caterpillar DW20 scraper in filling the impervious section of one of the wing dams. This material is called decomposed granite, but is actually a decomposed granite containing considerable impervious fine material. It weighs approximately 2,900 pounds per loose cubic yard. A total of over 4,000,000 cubic yards of this material will be placed before the work is finished.

The borrow area furnishing this material covers 900 acres, and the supply is practically unlimited, although the material lies in thin deposits seldom greater than 8 feet and more often around 6 feet. Depending on the loading section, a round trip for the Twin Power scrapers varied up to 15 minutes. The complete cycle took 4.70 minutes, with 0.70 of this time being used in loading. Since a pusher tractor was needed for the DW20, it was also used to help the Twin Power scrapers load. The units later worked alone, without a push cat, in other sections.

When these observations were made, the haul was only 2,600 feet, so the pusher was constantly in use. Prior to loading, the borrow pit was rooted heavily by an HD-20, pulling a LeTourneau K30 Rooter.

Most of the early "jumping around" phase is practically finished, and excavation operations have now settled down to a more or less definite routine. When CONTRACTORS AND ENGINEERS visited the project, the Marion 111-M was loading Euclids with large cobbles, which a gold dredge had thrown out as tailings some years ago. This material was being used both as riprap and raw feed for the rock production plant. The Bucyrus-Erie 54-B was working directly upstream from the dam along the toe of a stockpile, to round out riprap material. Much of the riprap material, as a matter of fact, was stockpiled under previous Government contracts when the American River channel was widened and deepened to provide tailrace getaway below the dam.

The P&H 1055 was working with a fleet of Euclids in the river channel upstream from the dam within the reservoir area, loading stream bed gravel for the intermediate zones of the dikes. A Lorain 50, equipped as a backdigger, was stripping off "dental excavation" from the abutments. The Caterpillar DW20 and the Euclid Twin Power scrapers were working hard on the excavation, and haul of impervious material.

Possibly one of the best equipment applications in evidence was the almost daring use of a Euclid 10BV loader, which was doing excellent work in the hard decomposed granite borrow pit. Although this material was hard—so hard it had to be ripped heavily—the loader was operating at 500 cubic yards an hour and better, dodging big granite boulders meanwhile. The material was being

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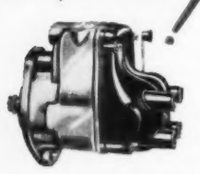

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picked up in as deep a cut as the ripper ordinarily handled, usually about 3½ to 4 feet. Auxiliary assistance in the pit was constantly on hand to keep the Euclid loader and its hauling fleet operating at high efficiency. For example, the big granite boulders in the pit were ripped out and then stacked by the dozer blade on the HD-20. The borrow pit floor was maintained smooth and level by either an Adams 610 or a Caterpillar No. 12.

The Euclid loader cut was so arranged that this unit could work up one side and down the other of the pit without very much stopping and turning. Allis-Chalmers HD-20's in front of and behind the loader kept it moving, even through this hard material. In combination with the pre-wetting of this borrow, the Euclid loader tended to break up the material nicely, so that when it was dumped on the fill, it was generally free from large lumps. Further action by hauling-unit tires and the Porter Super-Compactors developed a highly impervious condition as the fill was processed.

The impervious zone material is being placed at a 10 per cent moisture content, which is about 1½ per cent above the optimum for this material. Compaction tests are based on the Modified AASHO method, and require that 90 per cent of the density samples taken show a minimum compaction of 92 per cent. Specifications provide further that 50 per cent of the densities taken shall be 94 per cent or above. According to Corps of Engineers officials in direct charge of that operation, the average of all density samples taken so far is 95 per cent. Credit for this accomplishment goes largely to the realistic attitude of Corps of Engineers and Savin's officials alike, who recognize that with all other factors equal, a thin lift is easier to compact than a thick one.

Although specifications for the impervious lifts allow a 12-inch thickness, the material is seldom placed greater than 6 to 8 inches. Six passes of the Porter Super-Compactor will then do an excellent job where, if 12-inch lifts were used, a proportionately greater amount of compactive effort could be expected.

The intermediate dam-zone material consists of river-run gravel, composed of well rounded rock boulders from 6 inches down to No. 200 in size. This material is simply dumped, and requires no compaction or watering. The riprap protection is end-dumped over the side of the fill, and is spread by bulldozers. It, too, requires little manipulation other than this simple operation.

According to General Superintendent McCarthy, approximately 15,000 cubic yards of excavation of all types are being handled daily by this equipment fleet. This phase of the job is working a single 8-hour shift at present, 6 days a week. Sunday is devoted to washing, inspection, and service of each hauling unit.

Dikes to Be Undersealed

The Folsom Dam foundation material is adequate, but several cracks are found on both sides of the river. The foundation along the left bank is largely schist, while the right bank is mostly granite. The schist shows a tendency to take more grout than the granite.

Currently under construction under a separate Corps of Engineers contract with Processed Diamond Bit & Tool Co., San Francisco, Calif., is a piece of experimental pressure grouting on Dike No. 5, which was previously completed. This experiment consists of putting a casing down through the dike fill, and grouting it tight into the bedrock to a depth of 3 feet. A curtain of cement grout is then being injected under pressure to a depth of 60 feet into the bedrock material beneath.

Equipment being used includes a 500-cfm Gardner-Denver compressor, a Chicago Pneumatic No. 5 air drill, a Sullivan 22 gas drill, and a grout pump complete with slush pump, mixing tank, and agitator. The result of this work will probably govern to a great extent the grouting under Savin's contract. Savin is doing some grouting in advance of its dike construction, and of course the large grouting job will consist of filling the fissures underneath the main concrete dam and abutments after the dam concrete is well up.

Auxiliary Work Nicely Timed

All the auxiliary operations described in this article are beautifully timed, so far as the general construction schedule is concerned, and the earth-fill work especially is rolling exactly on time. When Project Manager Dave Stinson says the concrete barrier is ready to take on its load of reservoir, General Superintendent McCarthy will be very likely to echo, "Well, start filling, Dave. My dikes are ready, too."

Named by Armour Research Foundation

Paul H. Kaar has been promoted to Assistant Supervisor of the materials section at Armour Research Foundation of the Illinois Institute of Technology, Chicago, Ill.

A civil engineer, Mr. Kaar joined the staff of Armour Research Foundation in 1951 after being associated with the U. S. Bureau of Mines in Schuylkill Haven, Pa.

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Folsom Dam Project: The Over-All Plan

(*Continued from page 8*)

Folsom Dam

By any standard, Folsom will be one of the major dams in the nation. Its concrete river section will be 340 feet high, 1,100 feet long, and will block the American from bank to bank. About 5 miles of compacted earth wing dams and dikes will augment the concrete section. Its reservoir, extending 14 miles up the North and South Forks of the American River, will store 1,000,000 acre feet of water for the various design purposes. When full, the reservoir will make available an entirely new man-made lake for recreational purposes within easy driving distance of 300,000 persons.

Folsom Dam will trap water from a drainage area of 1,875 square miles. Carrying a mean annual runoff calculated from 1903 to 1949 at 2,652,000 acre feet, this drainage area has long been a problem. Ordinarily the American River flows at about 3,660 cfs, but maximum mean daily flows such as that on November 21, 1950, have gone as high as 132,000 cfs. At one time that day, the flow was calculated at 210,000 cfs, and the Corps of Engineers has from a historian of the forgotten past a 280,000-cfs record, which is supposed to have been reached on January 10, 1862.

Of the reservoir storage, 400,000 acre feet is allocated for flood control, irrigation, and municipal use, including power. An area of 512,000 acre feet is additionally assigned for power and as needed for irrigation and municipal use, and an 88,000 acre-foot segment will represent the minimum pool. Total capacity will be 1,000,000 acre feet.

The concrete portion of Folsom Dam will be 340 feet high, 1,400 feet long, and will contain 1,030,000 cubic yards of mass concrete in the gravity section. There will be a 5.1 freeboard above spillway flood pool elevation.

The concrete spillway is designed to discharge 567,000 cfs. Eight 42 x 50-foot tainter-type spillway gates will assist in regulating the spillway flow. Flood control outlets consist of 8 conduits 5 x 9 feet, with a total passing capacity of 28,600 cfs. In addition to the main concrete dam, there will be several rolled earthfill wing dams, a rolled earthfill auxiliary dam at Mormon Island, and several rolled earthfill dikes. The crest length of the rolled earthfill wing dams totals 8,800 feet, with a maximum height of 145 feet and a freeboard above the spillway pool of 5.1 feet. Almost 7,810,000 cubic yards of embankment material is being placed in earthfill wing dams alone.

The Mormon Island rolled auxiliary dam has a crest length of 4,800 feet, a maximum height of 110 feet, and contains 3,820,000 cubic yards of material. Mormon Island Dam, along with several of the dikes, was completed before the Savin contract was let. The total crest lengths of the 8 rolled earthfill dikes totals 11,710 feet. These dikes also have the common 5.1 freeboard level above the spillway pool. The maximum height of any dike is 100 feet, as in Dike No. 5. The total volume of embankment in these dikes is 1,200,000 cubic yards.

Quite an extensive contract history predates the present Savin work. For example, a right-wing dam was built by Ferry Bros. of Los Angeles, Calif., and completed in 1949. Hawley & Ramlose performed an abutment stripping contract in 1950. Further abutment stripping, which brought the foundations down to within a few feet of the final location, was done by H. Earl Parker of Marysville, Calif. In 1951, Morrison-Knudsen Co., Inc., Boise, Idaho, completed Dikes 1, 2, 3, 4, and 6, and also relocated Hinkle Reservoir, which supplies Folsom Prison water.

The same year, 7 miles of the Sacramento County road near the dam site was built and completed. The Mormon Island auxiliary dam, involving huge amounts of earthwork, was done by D & H Construction Co., Dallas, Texas, and completed in 1952.

The Folsom Power Plant, located at the foot of the dam on the right bank of the river, will provide 162,000 kw of generating capacity, and this power will be tied into the CVP system through the 20-mile-long Folsom-Elverta 230,000-volt line. The power plant and other features connected with that phase will be built by the Bureau of Reclamation, and work is now under way by Guy F. Atkinson Co.

Penstocks leading into the powerhouse, which pass through the dam section, will be placed under the Savin contract and picked below by the Atkinson forces under their USBR contract.

Other Structures Also Planned

The American River's comprehensive plan includes a number of

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other structures, which will round out the development program. For example, 7 miles downstream from the giant Folsom structure, Nimbus Dam will be built. It is a smaller concrete gravity barrier which will re-regulate the fluctuating flows released through the Folsom Power Plant. In addition to serving as a diversion point for future irrigation-water deliveries, its power plants will generate another 13,500 kw of electric power.

Nimbus Dam, which will be 76 feet high and 800 feet long, will create a 4,800-acre-foot lake. Unlike the larger reservoir behind Folsom Dam, the level of Nimbus Lake will be nearly stationary, thus lending itself more readily to aquatic events and lakeside picnic sites. Nimbus Dam is currently under construction by the USBR under a contract with Johnson-Winston Co.

Congress has authorized the Bureau of Reclamation to make studies leading to eventual construction of two main canals and a suburban conduit to distribute stored water. One canal will divert from Folsom Dam and deliver water as far north as Bear River, near Lincoln. The second canal, diverting from Nimbus Dam, would bring water to southern Sacramento County, and portions of San Joaquin County.

Another major unit of the development which is authorized for construction includes Sly Park Dam, Camp Creek Diversion Dam and Tunnel, and Sly Park irrigation conduits. This unit is integrated financially, and in an indirect way physically, with the other units of the American River division. Sly Park Dam will be an earthfill structure on Sly Park Creek, a tributary of the Cosumnes River, east of Placerville. The dam will be 180 feet high, 850 feet long, and will form a reservoir with a 41,000-acre-foot capacity.

A diversion dam at Camp Creek will augment the water supply of Sly Park Creek. Sly Park-Camino Conduit will be 9 miles long, and will supply irrigation and domestic water around Placerville and other portions of El Dorado County.

Further development, including 4 dams and 3 power plants, is under study in the upper American River basin. These dams would store more than 400,000 acre feet of water for irrigation, and provide additional control of runoff. The power plants have a potential capacity of 350,000 kw. Investigation of these proposed units is authorized in the American River division legislation.

Personnel

The Savin contract at Folsom Dam is a Corps of Engineers undertaking, and is under the general supervision of Col. C. C. Haug, District Engineer of the Sacramento, Calif., office. J. R. Morton is Chief of Operations, R. B. Jenkinson is Project Engineer, S. D. Burks is Field Engineer on the main dam, and W. G. Clark is Field Engineer on the earth portion of the structure.

Contractor's forces are headed by D. E. Stinson, Project Manager, assisted by L. F. McCarty, General Superintendent. C. W. Henning is Office Manager, L. G. Sumner is Project Engineer, A. W. Bartlett heads the concrete work, and Ted Cox is Master Mechanic.

Details of earthwork, stream diversion, and maintenance or repair of construction equipment on the Folsom Dam project are given in companion articles, beginning on pages 9 and 16. Aggregate production and concrete manufacturing and placement will be discussed in an article in the July issue.

This view upstream shows part of the cleared reservoir area and the broken cofferdam. In the background big shovels are at work on each side of the river

Catalog on Line of Hoists

A new catalog describes a line of hoists for power-scraper excavators, slackline-cableway excavators, and tautline excavators. Sauerman hoists are made in capacities up to 300 hp for electric, gasoline, or diesel power. Larger hoists of special design are also available.

The booklet gives specifications including operating speeds. Special sections discuss control mechanisms.

To obtain this literature write to Sauerman Bros., Inc., 522 S. Clinton St., Chicago 7, Ill., or use the Request Card at page 18. Circle No. 242.

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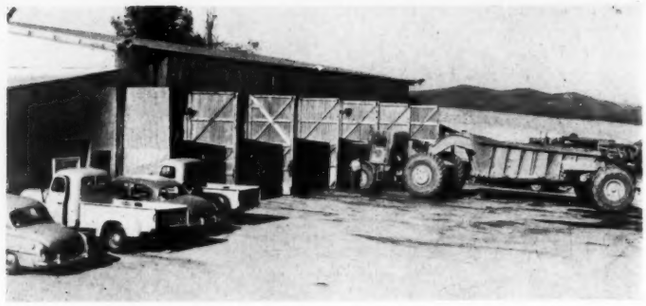

Here is the right-bank major equipment repair shop, where important overhauling is done. The Euclid in the picture is getting a routine inspection and adjustment.

• A manufacturer's representative who visited Folsom Dam recently concluded his report to the home office with these words: "Folsom Dam has one of the best programs of equipment care that I have ever seen."

That field man was truthful. In his report he was saying nothing that is not apparent to even a casual visitor who looks around the big Corps of Engineers dam spread under contract to Merritt-Chapman & Scott Corp. and Savin Construction Corp. on the American River near Folsom, Calif. As is usual in the case of dams the size of this one, the company has a tremendous equipment investment at stake, and the job is a long one. The $30,000,000 contract contains enough work to last until 1955.

Every piece of machinery on the project can be expected to do many hard hours of work at peak production between now and then. The equipment repair program is so designed that this machinery will stay on the line and, when the job is finished. will still be operating right up to the last in good condition.

Several factors enter into the Folsom Dam program. First, when the construction management selected Folsom equipment, units were picked which promised to do the hard work at Folsom and deliver consistent production with a minimum of upkeep cost. An example of this advance planning can be seen at the rock plant, where gravity dumping over a receiving hopper made it necessary to select good bottom-dump equipment. The Euclid belly dumps and Heiliners used on this operation, for example, were picked so that repairs and breakdown time would be minimized while at the same time the particular work operation at this point would move efficiently.

A second consideration in the maintenance setup is an extremely close tie between efficient operation, good management, and safety. When a visitor sees a motor grader blading a haul road, for example, that machine is doing three things. It is keeping busy, reflecting good management; it is lending itself to a good equipment maintenance program by removing rocks or other obstructions which could cut tires; and it is keeping up production. And

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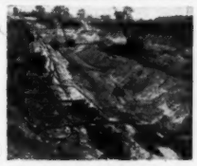

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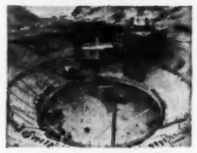

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it goes without saying that smooth job roads are safe job roads.

Equipment Service Organization

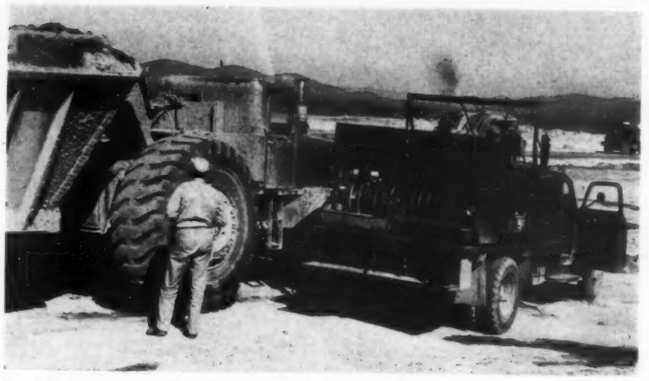
All equipment repair and maintenance is under the general supervision of Project Manager D. E. Stinson. L. F. McCarthy, General Superintendent, under whose wing most of the power shovels and hauling equipment works, has direct charge of equipment maintenance and service of that kind, and maintains an office in the right bank equipment repair shop. Equipment Superintendent Ted Cox, in another shop in the contractor's yard on the left abutment, is in charge of the maintenance and repair of all concrete handling machinery.

In planning an equipment maintenance organization, project management has been realistic. Most construction people who are realistic know what usually happens — or rather doesn't happen—when equipment is serviced at night. The Savin management has long been known as an outfit which takes excellent care of its equipment, so it is continuing that policy by taking no chances at Folsom on inefficient or uncertain service work. The units are serviced in the daytime.

In order to make sure that units can be greased in the daytime, Savin selected extras of key equipment. On the Euclid bottom and end-dump spreads, for instance, there are extras of these units which allow one machine to stand by. The one standby machine is available all day while other units are being serviced, and an operator bringing in a machine for fuel and grease simply jumps on the spare machine and continues his hauling. The grease crew is under no pressure to hurry the job, and in that way they do it thoroughly. Even so, a 25-yard Euclid can usually be finished, so far as the day's routine service is concerned, in 10 to 12 minutes.

"No Secrets"

When CONTRACTORS AND ENGINEERS asked McCarthy his secret of getting such a glowing report from the manufacturer's field representative, he replied, "There are no secrets. It's just a program filled with sound policy, a regular schedule, and a hell of a lot of hard work." As a matter of fact, that does sum up quite neatly the equipment program, except that the "policy" and "schedule" portions should be underlined.



A mobile service van catches up with a Euclid. The unit will be on the production line again in 10 minutes.

The secret, if there is one, is simply that McCarthy and Cox have service schedules set up for each piece of equipment, and when the time comes for this service to be done, it is done without question.

Huge Equipment Fleet Serviced

The actual cash value of Folsom Dam equipment represents a sizable percentage of the contract cost. There are 15 Euclid FTD rear dumps, 15 Euclid 18LFTD bottom dumps, 3 Euclid 43FTD bottom dumps, 3 Model 800 Heiliners, 4 Euclid Twin Power scrapers, 1 DW20, 1 Euclid 10BV loader, 3 International TD-24's 4 HD-19's, 3 HD-20's, and 8 Caterpillar D8's. There are 2 Caterpillar No. 12 motor graders, an Adams 610 motor grader, 5 large portable compressors, an Ingersoll-Rand Quarrymaster drill, 2 Porter Super-Compactors, and numerous

(Continued on next page)

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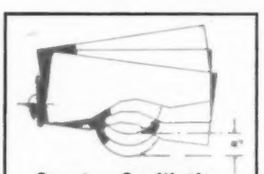

Greater Oscillation

Each wheel of the Southwest Compaction Roller is mounted in an independent weight-box unit. Hinge point of wheel is at extreme rear of its own weight-box. Closely spaced wheels give maximum compaction with as much as 12" variance in height. Offers oscillating freedom and greater compaction on uneven ground

ON THE BIG JOBS use the Southwest Compaction Roller to keep pace with speedy, 24-hour job schedules and bigger earthmoving equipment. It compacts heavier lifts with fewer passes. Weight-box units oscillate up and down independently to provide a constant compaction weight on each tire regardless of ground contours. There is no bridging, no shifting of load.

The Southwest Roller has flexibility to suit varying job requirements. Weight-boxes may be filled with wet or dry sand, earth, scrap or other materials. Sectionalized hauling yoke permits use of any combination from 3 to 6 weight-box units. Sizes and capacities range from 10 to 200 tons, suitable for light, medium or heavy duty compacting of earth.

Type Soil	Symbol	No. of Single Passes	% Moist	FIELD Dry Density Lbs./Ft.³ Passing #4 Actual	FIELD Dry Density Lbs./Ft.³ Passing #4 Corrected	OPTIMUM % Moist Pass #4 Sieve	OPTIMUM Dry Density Lbs./Ft.³ Pass #4	OPTIMUM Ratio Den.—Opt —Pass #4
Silty Sand	SM	6	7.3	128.0		8.0	133.6	96.0
Sandy Clay	CL	6	10.2	110.0		15.3	116.2	95.5
Sandy Clay	CL	6	14.3	114.0		15.3	116.2	98.0
Sandy Silt	ML	6	14.6	115.0		14.2	120.8	92.0
Clayey Sand	SC	6	9.2	125.2		10.2	128.3	97.8
Silt	ML	6	6.6	119.0		9.5	125.0	95.0
D.G	SW	6	8.7	126.7		9.2	132.0	96.0
D.G	SW	6	5.2	129.0		7.8	135.0	96.0
Straight Clay	CL	6	6.3	122.8		10.3	127.1	96.6
Pit Run	GW	6	4.8	133.5	126.5	7.7	134.5	95.0

The above data on unit weight of soil samples has been taken from average compacted fills placed in lifts from six to twelve inches as specified. The unit weight per pneumatic wheel load being 35,000 lbs

WRITE TODAY for illustrated folder which gives complete data and specifications.

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HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

Folsom Equipment Gets Good Service

(Continued from preceding page)

pieces of smaller equipment connected with that phase of the work.

Shovel equipment includes such high-priced machinery as a Lorain 50 backdigger, two 504-M Lorain truck cranes, an 820 Lorain dragline, a Manitowoc 4500 5-yard dragline, three 80-D Northwest machines, a 54-B Bucyrus-Erie, a Model 1055 P&H, and a 111-M Marion rig. On the concrete side of the river, equipment includes Jackson vibrators, a Colby double-cantilever crane, two Washington revolving cranes, to say nothing of a big Johnson automatic batch plant and the largest refrigeration plant for its purpose in the world.

Considering the equipment outlay, the service force is not very big.

Standing beside one of the big Euclid units, General Superintendent L. F. McCarthy, left, talks to Project Manager D. E. Stinson.

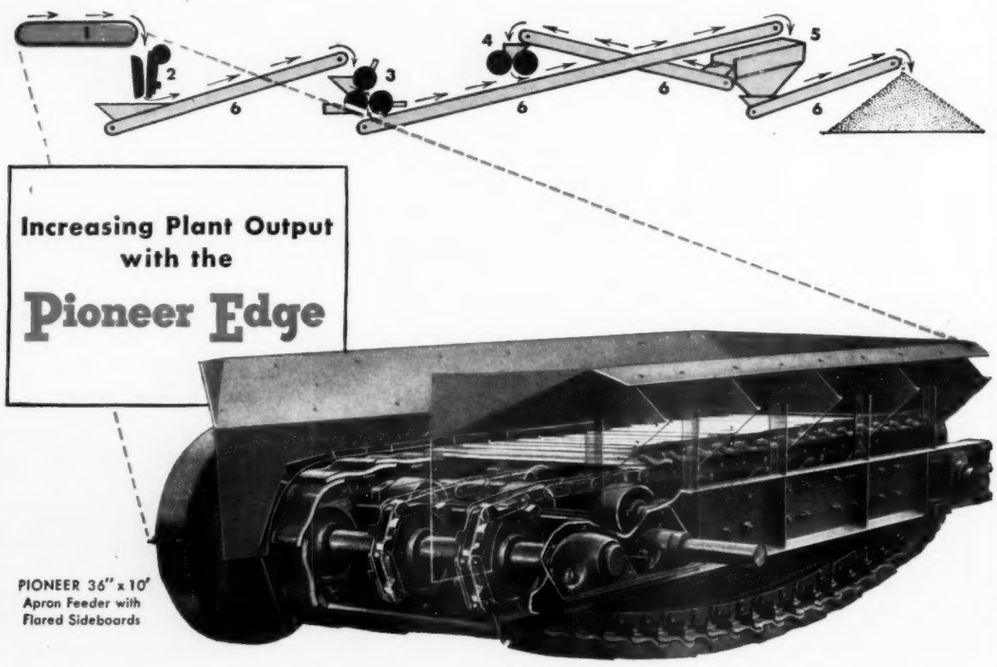
In the right-bank dirt shop, for example, there are 6 mechanics, 3 welders, and two 3-man crews of grease monkeys. Jerry Hughey at this shop handles all buying of spare parts and welding rod. At the left-bank shop, where concrete equipment is handled, Ted Cox runs the show with two mechanics assisting. In spite of the big equipment list, considerable standardization has been achieved. All small trucks, for example, are Chevrolets. All trucks which haul rock from the production plant to the pickup point at the dam are Macks. There has even been a standardization on lubricants, with Texaco greases and oils used extensively. Some Standard RPM Delo oil is used in Caterpillar engines.

Tough Service, Too

Folsom Dam offers no conditions of service calculated in any way to "baby" equipment. There is no light duty work. When CONTRACTORS AND ENGINEERS visited the job, a Lorain backdigger sat on one of the abutments doing "dental excavation", picking loose a piece here and there from the hard abutment foundation. Each bucketful the machine tried to dislodge from this point shook the rig from one end to the other. As the machine made each pass, smoke flew from the dipper teeth, although the day was clear and bright. In work like this, there is no talk of babying machinery.

Other things are almost as bad. The Euclid loader, working in decomposed granite, changed a cutting tip every day. Ripper teeth needed new points once a shift, and shovel teeth, even though hardfaced with the finest rod, lasted only 3 shifts. A scraper cutting edge did well to last 40 hours. Even tungsten carbide drill bits dulled in about 600 feet of drilling, which shows that the material was harder than usual.

The job is situated, too, in an area muddy in winter and dusty in summer. Borrow pits have been stripped over great areas, and although extensive watering is being done, dust and dry weather are still problems.



Increasing Plant Output with the

Pioneer Edge

PIONEER 36" x 10' Apron Feeder with Flared Sideboards

Control the feed...Increase production!

WANT to squeeze every possible ton of material through your plant that it's able to handle?

Then consider the Pioneer Apron Feeder, and how it takes over the job of keeping the primary crusher going at top capacity by feeding a continuous, even flow of material at all times. No surges to choke the crusher . . . no voids to make it run empty.

Here again is the famous PIONEER EDGE in action, for these rugged Feeders are built to take the heaviest impact, the heaviest dump loads from the quarry or mine. Available with straight, flared, or no sideboards, and with a type of drive to fit any installation.

FEATURES

1. ½" thick forged steel pans, rigidly supported by rollers, take heaviest shock loads. *No thicker pans available on any comparable feeder.*
2. Pans are overlapped to give extra strength and rigidity. Provide corrugated surface which reduces slippage
3. Sideboard wear plates are easy to change.
4. Quick-acting clutch or push button operation gives precise control of flow

SPECIFICATIONS PIONEER APRON FEEDERS

Width of Feeder	Capacity in tph at specified ft. per minute				Approx. wt.* with flared sideboards
	15'	20'	25'	30'	
30"	112	148	186	226	7140
36"	162	216	270	310	7895
42"	222	294	369	444	8490
48"	289	386	482	575	9225

*10 foot length, built-in speed reduction for use with crusher

BUY BOTH! HIGHER OUTPUT LOWER UPKEEP

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Pioneer Engineering Works, Inc., 1515 Central Ave., Minneapolis 13, Minn.
Subsidiary of Poor & Company • Chicago

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☐ GRAVEL PLANTS ☐ WASHING PLANTS ☐ MECHANICAL FEEDERS
☐ ROCK PLANTS ☐ BITUMINOUS PLANTS ☐ VIBRATING SCREENS
☐ JAW CRUSHERS ☐ APRON FEEDERS ☐ BUZZER SCREENS (LIGHT DUTY)
☐ ROLL CRUSHERS ☐ ORD FEEDERS ☐ CONTINUFLO CONVEYORS

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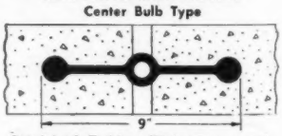
Servicised
Molded Rubber WATERSTOP

FOR EXPANSION JOINTS
Center Bulb Type



Servicised Rubber Waterstops meet all standard engineering specifications. Made of durable, elastic, cured rubber compound.
Both types available in 6", 9" and 12" widths in any required length.

FOR CONSTRUCTION JOINTS
Flat Type

Write for the Servicised Products Catalog. Sent without obligation.

SERVICISED PRODUCTS CORP.
6051 W. 65th ST • CHICAGO, ILL

These operating conditions are being met usually by following the manufacturer's recommendations to the letter, or at least to the intent. Carefully kept card records insure that no engine will run on its lubricating oil for more than 60 hours at a stretch. When dust conditions make the replacement of oil and air filters necessary, that work is done without argument.

McCarthy goes even further than this. Once each week, usually on Sunday, every hauling unit is sent through a headquarters yard and washed. Malsbury steam cleaning equipment is also available on the left bank setup. Dirt hauling equipment, washed over a weekend, can be given a better visual inspection for cracks which might be developing, and the process will show up other signs of incipient failure. In addition, it has a psychological advantage, apparently, in that it impresses on each operator the fact that each unit is something in which to take pride.

A sizable stock of spare parts is available at the dam site, and of course Savin depends to a great extent on the parts stocks of the various equipment distributors in the California Central Valley vicinity where the dam is located.

Much of the routine equipment service is on a mobile basis, with grease and fuel delivered by trucks which visit the machines where they are working. Grease-truck operators have favorite wide spots where they can pull off to one side and service a whole spread of equipment as the various units roll by. Each grease truck has a 65-cfm compressor and 8 Lincoln pumps for the dispensing of oils and greases of various kinds. In dusty weather, these areas are sprinkled to keep dust down to a minimum.

Tire Policy Pays Off

Some of the tires on the equipment have been there for as long as 2,300 hours without a recap. While it is true that some of this service life was put on under easy digging conditions on the New Jersey Turnpike, a good many hard work hours have been logged at Folsom Dam, where conditions underfoot are none too good. That kind of service life, in any case, can be credited to the company's policy of care.

Who hasn't seen an operator of large rubber-tired equipment, when his wheels begin to sink in soft material, continue to keep his transmission in gear and throttle open until the tires smoke? You will not see this kind of treatment on Folsom Dam. Where tricky underfoot conditions are present, tractors work nearby to make occasional pulls, and operators will call for their assistance promptly. Haul roads and even pit floors are maintained in such smooth condition that there is never any question about fast safe travel.

Tires are protected in nearly every phase. Euclid-mounted tires under the loading shovels are protected, because the spotter who controls their movement picks out by hand the occasional rocks which would damage a tire. The first thing each truck driver does on mounting or dismounting from the machine in his care is to look between duals for wedged rocks. Haul roads are bladed regularly, often more than once a day, to eliminate the causes of stone bruises. McCarthy doesn't hesitate even to haul in decomposed granite topping material where the haul road areas are rocky. Even around the carpenter yard a good housekeeping policy is followed, so that smaller tires on pickup trucks and passenger cars will never hit a nail.

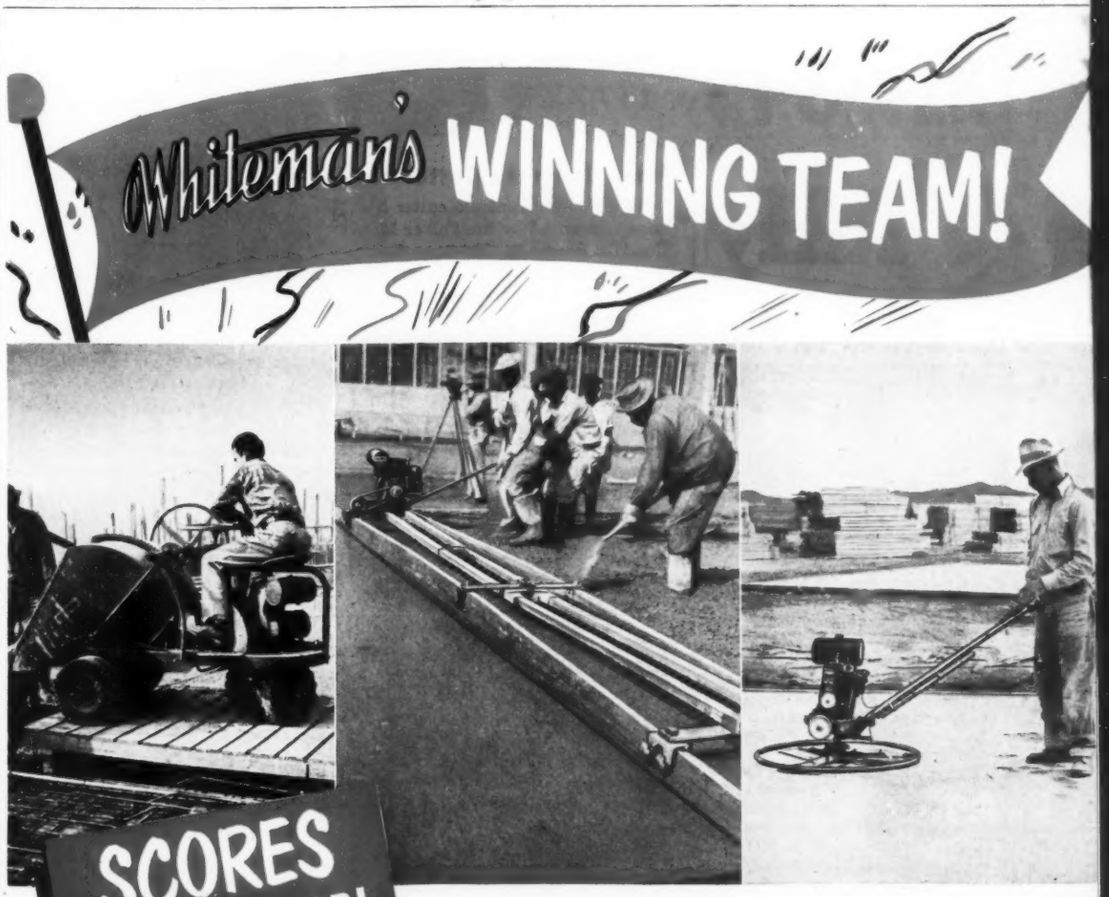
Large-size tire repair work is handled by one special service rig, which does nothing but that. Regular tire inspections are made, and if a tire cut should develop, that tire is removed and replaced by a spare, for there are spare tires on the job as well as spare Euclids, spare engines, and even spare differential and transmission units.

The amount of money saved by the tire-equipment-service program is incalculable. Some new service records may be set at Folsom.

As McCarthy explained, there is no secret. Folsom's management has simply taken the manufacturer's recommendations, disseminated the literature to the various shops, made service schedules for all the mechanics, set up programs which it has followed to the letter, and demanded that every man who has a part in the maintenance and operation of machinery adhere to that policy.

Neither Cox, McCarthy, nor their boss Stinson can see a thing about their service program which the laws of common sense and economics do not dictate. But the equipment service man did, and he made a note of it, calling it to their attention. He said in effect, "You have purchased fine equipment. You are working it at capacity, and above all, you are giving it the service which will make it continue to work at capacity throughout this job. I call it unusual. I call it the best that I have ever seen."

You can help save a life by ordering a $10 CARE food package for delivery to a needy person overseas. Or send a contribution, in any amount, to CARE, 20 Broad St., New York 5, N. Y.



It's the *modern,* efficient way to lay concrete... in a *fraction* of the time. Whiteman Power Buggies, Screeding Machines and Floating-Finishing Machines work together as a perfect team to produce a *better* slab, while *drastically* reducing costs. Send coupon for details *right now!*

PLACING

WHITEMAN POWER BUGGY Fastest, cheapest way to haul and place concrete. Does the work of 6 wheelbarrows. Speeds over light scaffolds, up 25% grades, never tires or slows up. Positive "in-gear" control permits partial or full dumping. Carries 12 cu. ft., weighs only 692 lbs. Travels up to 16 mph. 7.5 h.p. air-cooled engine. Priced to quickly pay for itself.

SCREEDING

WHITEMAN SCREEDING MACHINES Puddle and vibrate the concrete throughout entire depth and area, thoroughly compact slab, bring moisture to surface and screed slab to a perfect level. Heavier aggregates do not settle, producing better slab. New, more powerful models RS-11 and 52-15 have telescopic frames adjustable 3' to 15' wide . . . adaptable to any job.

FLOATING-FINISHING

WHITEMAN FLOATING-FINISHING MACHINES Produce a perfect, smooth, level surface in record time. Does work of 5 men with hand trowels. "Snapon" float trowels compact slab, drive out air, bring up moisture. For finishing, float trowels are quickly removed and tool-steel finish trowels used. Trowel pitch is adjustable while in operation.

Whiteman

THE LEADER IN CONCRETE EQUIPMENT

WHITEMAN MFG. CO., DEPT. CE
3249 Casitas Ave., Los Angeles 39, Calif.
Please send prices, literature and name of distributor for____Power Buggy____Screeding Machines____Floating Finishing Machines.
Name_____
Firm_____
Address_____
City_____ Zone____ State_____

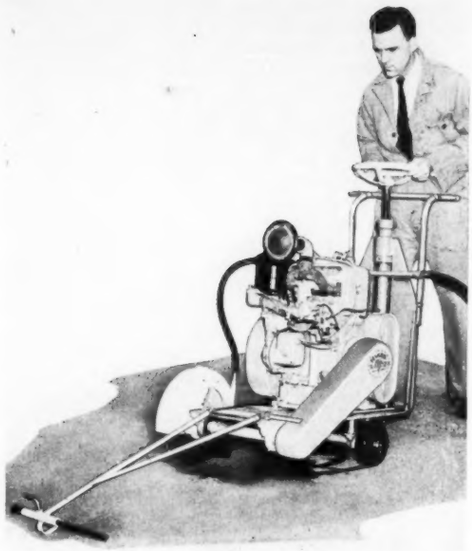
Porous Drainpipe Data

Porous concrete drainpipe is described in literature from the Walker Cement Products Co., Little Ferry, N. J. The joints of the pipe are formed of solid concrete and extend about 1 inch at each end. The pipe itself is made of a mixture of portland cement, water and aggregate.

The manufacturer points out that the pipe is permanently permeable in its entire circumferential area since it does not clog. The slip-joint construction makes the pipe self-aligning and eliminates wrapping, joint bands, blocks, and wedges.

The pipe comes in sizes ranging from 4 to 24 inches in diameter and 24 to 36 inches laying length.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. No. 175.



The 3-wheel Felker concrete cutter uses diamond blades up to 18 inches in diameter.

New Concrete Cutter

A lightweight concrete cutter has been announced by the Felker Mfg. Co., 1128 Border St., Torrance, Calif. The 3-wheel Model 135 has a 13.5-hp gasoline engine driving a standard 12-inch-diameter diamond blade which cuts to 3½ inches deep. Larger blades with diameters up to 18 inches may be used.

The blade is mounted on a single end spindle and is protected with a guard, the front half of which is hinged and can be raised out of the way. Cutting close to curbs and walls can be done without removing the guards. The blade depth is adjusted by a manually operated screw.

The base casting is mounted on three Colson Durex bearing wheels. A hand wheel steers the rear wheel. Coolant is fed by an external hose connection. Slotted blade collars pick up the coolant and eject it under centrifugal force over both sides of the wheel and rim. The manufacturer recommends the new concrete saw for such jobs as cutting contraction joints, curbings, driveways, and walks.

For further information write to the company, or use the Request Card at page 18. Circle No. 199.

Concrete Bridge Members Prestressed at Plant

Pretensioned-prestressed-concrete bridge members may be cast at a plant and transported to the construction site where they are assembled into a bridge superstructure.

The development of this method and the factory production of the bridge members are described in a booklet from the Concrete Products Co. of America, 1505 Race St., Philadelphia 2, Pa. The bridge members are made with high tensile wire strands on fixed casting beds. In one installation described, the finished members were laid astride the bridge piers and tied together with steel rods inserted in pre-made holes. The keyways were grouted with cement mortar to form a single structural unit.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 283.

Folder on Power Rammer

A power rammer is shown in a folder from Warsop Power Tools, Inc., P. O. Box 1809, Wilmington 99, Del. The Benjo rammer has a steel foot forged integrally with the piston rod. Its working diameter is 9½ inches. A smaller foot of 7½-inches working diameter is available for work in narrow trenches. The rammer foot is also provided with a replaceable vulcanized rubber block to reduce shock. A semicircular operating handle is said to make it possible to use the rammer in narrow trenches.

The folder has a breakdown of tamping operations to illustrate how the power rammer reduces labor and material-hauling costs.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 178.

NOW Tuffy®

Can Save Up To 300%

Goodbye To Waste of Good Dozer Rope!

Tuffy Dozer Rope is specially constructed with the extra stamina needed to stand up under the rough dozer treatment. But Tuffy engineers went even further to cut your costs! They devised a special reel to carry 150′ of Tuffy Dozer Rope on the tractor. When 10′ or so of rope is crushed or cut on the drum, you just feed enough from the reel to replace the damaged part! The cut can be made and the machine back in use in 15 to 20 minutes—less than half the time normally needed! Figuring roughly, there are two Dozer Ropes to a reel. This gives you an approximate ratio of 6 to 2 . . . about 300% increased service! Mount a reel of Tuffy Dozer Rope just back of the wedge socket on your Dozer and see how much longer service you get! ½" rope, furnished in 150′ reels.

Mail Coupon for FREE Folder on Tuffy Dozer Rope

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Neo-Flasher MODEL NO. 4-100LSR ..... VISIBILITY UP TO 2 MILES

Model 4-100LSR, bolted to the Neo-Flasher Barricade Light Unit does a "round the clock" job of traffic control.

DIRECTIONAL WARNING LIGHT

EFFECTIVELY BRINGS ONCOMING TRAFFIC UNDER CONTROL

PREVENT FIRE HAZARDS, ACCIDENTS, AND LAWSUITS . and enjoy SAVINGS NEVER BEFORE REALIZED! Install Model 4-100LSR on the barricades at both ends of your construction, utility, or maintenance job. Model 4-100LSR will operate up to approximately 1000 hours on only one Neo-Power Pak Battery; 2 Neo-Flasher 4-100LSR's will replace at least 4 kerosene torches or lanterns. Eliminates fuel, labor, and costly maintenance

INSIST ON THE ORIGINAL Neo-Flasher

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407 Commercial Center St. • Beverly Hills, Cal

Tuffy®

Saves Nearly 50% on Scraper Rope Costs!

"Outlasts (Other Rope) Almost 2 to 1"

Says Owner of a Middlewestern Construction Company
(Name on Request)

From his records of yardage and service life, this Nebraska construction company owner learned that he could save nearly 50% on scraper rope costs by switching to Tuffy! And there's a good reason why: Tuffy is specially made to stand up under the stresses and strains of wheeled scrapers. It's flexible to withstand more sharp bending and to wind snugly and smoothly on the drums. It is designed to resist drum crushing caused by cross-overs. And Tuffy is easy to order — just specify length, diameter and "Tuffy."

Get This FREE Folder on Tuffy Scraper Rope

MAIL COUPON TODAY

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Specialists in Wire Rope and Braided Wire Fabric
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Please send my FREE illustrated folder on Tuffy Scraper Rope.

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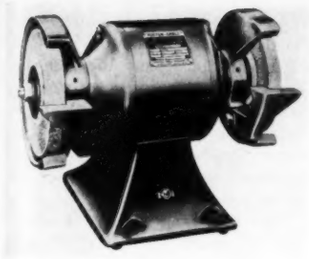

Bench-Grinder Line

A ¼-hp, double-arbor, lathe-type bench grinder suitable for intermittent small-shop work is one of a series of four models introduced by the Porter-Cable Machine Co., 14 Exchange St., Syracuse 8, N. Y. Model 116 takes 6 x ⅝-inch grinding wheels with ½-inch bore.

The Model 517 is a ⅓-hp grinder taking 7 x ¾-inch grinding wheels with ½-inch bore. This machine is intended for large automotive shops. Larger models include ½-hp and 1-hp units.

All the grinders have totally enclosed motors and are said to give vibrationless operation. Ball bearings are presealed and require no lubrication. Wheel guards are removable. All grinders run at 3,450 rpm except the largest model, which turns at 1,750 rpm.

Standard equipment with each machine includes one fine-grit and one coarse-grit grinding wheel, tool rests, and three-wire cord with connector. The three larger models are provided with end shields, built-in exhaust outlets, and spark arrestors. Accessories include grinding wheels, wire-wheel brushes, cloth-buff wheels, and metal-framed safety-glass eye shields.

Porter-Cable also makes two abrasive-belt bench grinders. The Model CN 2 performs four types of grinding and surfacing: contact-wheel, flexible-belt, platen, and contour work. It has a ½-hp motor and uses 2-inch-wide endless abrasive belts of any grit. It can be used vertically, horizontally, or at any angle between.

A 1-hp heavy-duty horizontal bench grinder, Model BBS, uses abrasive 2½ x 60-inch belts which can be interchanged for various grits.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 202.

Line of Steam Cleaners

A folder on a line of steam equipment-cleaners is available from Kelite Products, Inc., Box 2917 Terminal Annex, Los Angeles 54, Calif. The line includes three models that deliver 110, 160, and 300 gallons per hour of cleaning solution. The working pressure of the cleaner is 80 psi at 320 degrees F.

According to the manufacturer, the unit's gas burner works efficiently on gas as low as 1-inch pressure. The oil burner operates on diesel fuel, stove oil, or kerosene.

Other parts discussed in the folder include the gun, nozzle, pump, and safety features.

To obtain this literature write to the company, or use the Request Card this is bound in at page 18. Circle No. 181.

Bin-Level Indicators

Improvements in all their models of bin-level indicators are announced by the Bin-Dicator Co., 54-13946 Kercheval Ave., Detroit 15, Mich. Frame design has been changed to permit easier access to operating mechanism and wiring connections, better and simpler switch installation, and greater flexibility in wiring and conduit installations. Units equipped with the mercury switch, general purpose Micro switch, and explosion-proof Micro switch also have a new diaphragm back plate which increases sensitivity and limits diaphragm travel to the minimum necessary for switch actuation.

For further information write to the company, or use the Request Card at page 18. Circle No. 295.

Asbestos-Cement Roofing

A manual giving data and specifications for corrugated asbestos-cement roofing and siding is offered by the Philip Carey Mfg. Co., 3165 Wayne Ave., Cincinnati 15, Ohio. Included in this 82-page manual are drawings and photographs showing exact method of application and erection. Recommendations for application, shipping and crating information, suggested specifications, and information for estimating quantities are also given.

The booklet describes the company's estimating and engineering services. Additions and changes in specifications will be provided to keep the book up-to-date. The price of the book is 50 cents.

To obtain this literature write to the company, or use the Request Card this is bound in at page 18. Circle No. 232.

PLENTY OF **POWER**

FOR **BIG PRODUCTION**

THE Ronald Kenyon Construction Company of Des Moines requires a lot of hot mix asphalt every hour, to resurface U. S. 34, east of Ottumwa, Iowa. The big Madsen 3000-pound asphalt plant shown above does the job, and a Cat* D375 Electric Set supplies power for the entire plant. The engine works hard eight hours a day, 24 days a month. Superintendent Henry Wilson is thoroughly satisfied with his Cat equipment. It asks no quarter and requires minimum maintenance—a common quality of the whole Caterpillar line.

Caterpillar Diesel Engines and Electric Sets are easy to operate. They deliver full power without fouling using No. 2 furnace oil, and are available in 12 sizes up to 500 HP and 315 KW. Installation is quick and easy.

See your dealer. Get the whole story *and* on-the-job proof.

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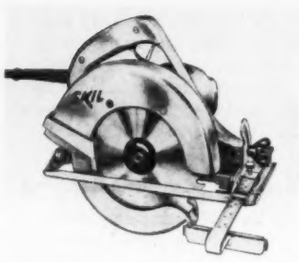
NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

Portable Electric Saw

A portable electric 7¼-inch saw is announced by the Skil Corp., 5033 Elston Ave., Chicago 30, Ill. The new Skil Homebuilders saw, Model 687, has an overhead-type handle for 1-hand control, a built-in rip fence, and an automatic telescoping blade guard with retracting handle.

Bevel cuts up to 45 degrees can be made. Depth of cut is regulated at one point by use of a new lever-type clamp and is adjustable from 1/16 to 2⅜ inches.

The saw weighs 13¼ pounds. It cuts 2-inch dressed lumber at 45 degrees and crosscuts 2-inch rough lumber. With a speed of 5,000 rpm



it is said to be suitable for cutting and scoring concrete, cement block, stone, metal, and composition.

For further information write to the company, or use the Request Card at page 18. Circle No. 247.

Multiple-Dwelling Code Is Proposed

During the latter part of April, public conferences were held in thirteen cities throughout New York State to discuss a building-construction code, proposed by the State Building Code Commission, which applies to multiple dwellings such as apartment houses, hotels, and other buildings used for multiple-residence purposes.

Invited to participate by the Commission were 13,000 individuals, including municipal officials who have shown an interest in its program. Prior to the conferences, the Commission issued its recommendations for review. The code—the fourth document to be issued by the Commission—is a performance-type code like its predecessor, the one and two-family dwelling code. It is arranged in five parts: general provisions, space requirements, structural requirements, fire-protection requirements, and equipment requirements.

The provisions of the proposed code, in so far as it is practicable, were composed in terms of performance objectives, making adequate performance the test of acceptability of materials and techniques, rather than rigidly specifying methods of compliance.

A review edition of the building-construction code was mailed to 543 associations in New York State which are in some manner concerned with building regulations, including architectural and engineering societies, builders' organizations, building trades councils, real estate, finance, and civic groups. The Commission asked these groups to set up review committees to analyze the suggested regulations and transmit their recommendations to the Commission.

In order to encourage such criticism on the broadest possible scale, copies of the review edition were sent far enough in advance so that these committees might bring up pertinent questions during discussions at the conferences. Comments, accepted until June 10, the closing date of the review period, will be considered in revisions for the final version of the code to be promulgated later this year.

The State Building Code Commission is concerned only with regulations for the construction of buildings and the installation of equipment. The purpose of these regulations is to establish safeguards for the safety, health, and welfare of the occupants and users of the buildings. At present, the Commission is preparing requirements for all other types of building construction so that eventually it will be able to provide a statewide comprehensive performance building code applicable to all types of buildings. Municipalities will be able to adopt the State's program by a simple resolution, thus affording its citizens the advantages of the State's services without cost.

Conferences on the multiple-dwellings code were held in Albany, Binghamton, Buffalo, Garden City, Glens Falls, Jamestown, Monticello, Plattsburg, Rochester, Syracuse, Utica, Watertown, and White Plains.

Waterproofing Agent

A line of waterproof resurfacing agents for masonry is made by the Reardon Co., 7501 Page Blvd., St. Louis, Mo. The products are Bondex cement paint and Bondex heavy-duty, for moisture control problems, and Quick Plug, a patching material said to stop the flow of water leaking through masonry breaks under pressure.

The heavy-duty product is an aggregate-type wall coating, that is applied with a brush. It gives a thick white coating that is said to penetrate the masonry.

For further information write to the company, or use the Request Card at page 18. Circle No. 195.

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The Universally Popular
BUCKETS
ARE IDEALLY ADAPTED TO ALL KINDS AND MAKES OF CRANES
There are dozens of types and kinds of cranes—each with its own features but one outstanding clamshell bucket.
Observe these various machines in action and you'll find an impressively large percentage of them equipped with Owen Buckets.
This preference has been gained through years of unequalled digging ability, speed of operation and durability.
You can obtain an Owen Bucket from us exactly suited to your present crane or have it delivered as a part of the complete crane unit.
For the utmost in performance and service on any crane investigate and purchase an Owen Bucket. Write for the Owen Catalog.
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Modern Bascule Span Replaces Old Truss

Bridge Connecting Islands in Lake Champlain Is Built With Piers Down to Rock; Steel Sheeting for Cofferdams

By ALBERT C. SMITH, Field Editor

A comparison between the old and the new—a double-leaf bascule replaces an old one-lane steel through-truss bridge. *C. & E. Photo*

• NEW bridge and highway facilities should attract a record number of vacationers this year to Vermont's picturesque island resort area that bisects the historic waters of northern Lake Champlain. Flanked on the west by New York's towering Adirondacks and on the east by Vermont's Green Mountains, slender Grand Isle and North Hero are due to play a more important role in the State's bustling vacation business, now worth well over $80,000,000 a year.

The 1-lane steel through-truss bridge spanning The Gut that separates the 2 islands had been a major bottleneck for many years. Few small craft could manage the low clearing, and each opening required the tender to hand-crank the 1890 swing-span for several minutes. The condition became increasingly worse as more and more summer vacationers clogged U. S. 2 to view the waters made famous by Champlain, Father Jogues, Montcalm, and the Algonquin Indians.

Double-Leaf Bascule

The Vermont Department of Highways decided some years ago to ease the situation with a double-leaf bascule bridge. In August 1950 the Lambert Construction Co., Inc., of White River Junction, Vt., was awarded the $1,075,000 contract.

The steel and concrete structure has a main bascule span of 92 feet to provide a fender-to-fender clearance of about 80 feet. The vertical clearance at mean high water is 18 feet.

The reinforced steel deck is 30 feet wide and opens to a 75-degree angle. The steel girders are supported by 2 concrete bearing-point piers, 2 intermediate piers, and 2 abutments. Bearing-point and intermediate piers are 27 feet apart, while secondary piers and abutments are 54 feet apart. Bearing-point and intermediate piers are tied together by two 6-foot-square concrete underwater beams.

The operator's 2-story tower is octagonal in shape with 9-foot 7-inch sides. The main floor has one window on each angular face. The 6 windows on the top floor give the operator a clear view of the surrounding waters. Control machinery is on the bottom floor while control panels are on the top floor.

Widens Approaches

When Lambert Construction began work in August 1950, the superintendent moved the bridge operator's shed in on shore where it served as his office. His next move was to widen several thousand feet of rock-fill approaches so that he could get equipment and materials out to the bridge site in the middle of The Gut.

Fortunately, a slate-shale pit on the south bank provided all of the 115,000 cubic yards for the approaches. Two Ingersoll-Rand wagon drills drilled 12-foot holes on 3-foot centers. Standard Timken steel bits were used on the soft rock. Du Pont 40 per cent dynamite was used and

(Continued on next page)

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and you may arrange for them at

THE BETTER TRAILER SALES AND SERVICE

- CUTS COSTS
- SAVES TIME
- FOR BIG or LITTLE JOBS
- FULLY EQUIPPED

THE INTERIOR OF A MOBILE-OFFICE

- ALL SIZES
- BUILT TO YOUR SPECIFICATIONS
- USED NATIONALLY BY THE LARGEST FIELD COMPANIES

Yes, they're here, your Mobile Field Office Trailers, here to cut your operating costs, to save you time and really pile up profits. For little jobs or big jobs lasting from 3 hours to 3 years. They're using them just across the street or as far away as South America.

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Functions Performed by **GREER ACCUMULATORS**

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2. PRESSURE-VOLUME COMPENSATOR for
   a. Leakage compensation.
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3. DISPENSER OF FLUIDS and Lubricants.
4. TRANSFER BARRIER for Fluids and Gases.
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   a. Absorb line shocks.
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Hydraulic components seldom get such an exhaustive workout during manufacture as Greer Accumulators. At every step on the production line the accumulator parts are checked, double-checked, and signed for by an inspector before the next operator will touch them. Finally the accumulator is cycled as a unit under simulated operating conditions. The inspector who puts his final OK on the tag will bet his life that the accumulator will function properly.

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District Offices: 407 So. Dearborn St., Chicago 5 • 2832 E. Grand Blvd., Detroit 11

Manufactured and distributed under license in Great Britain by Finney Presses Ltd., Berkeley St., Birmingham 1, England.

Modern Bascule Span Replaces Old Truss

(Continued from preceding page)

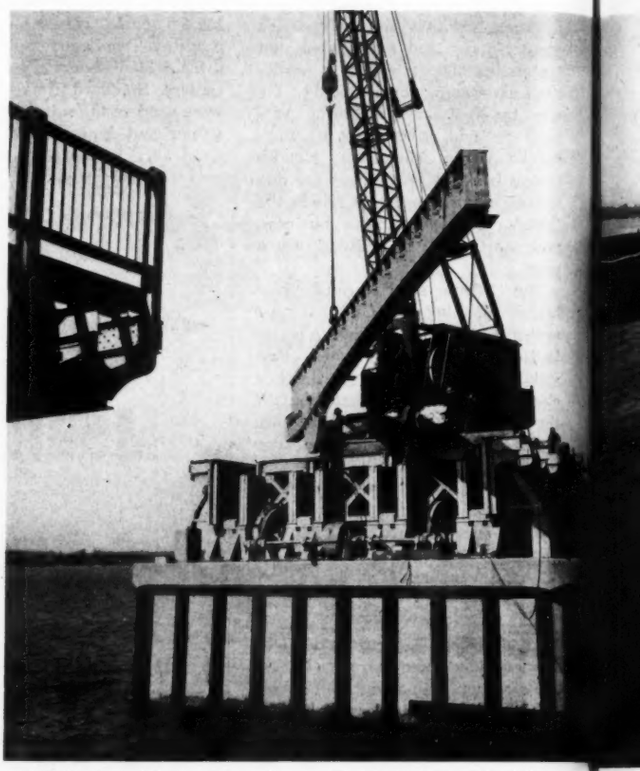
150 holes were fired per shot.

The blasted rock was excavated with a 1¾-yard Lorain and hauled in five 8-yard trucks. An International TD-14 dozer worked on the fill.

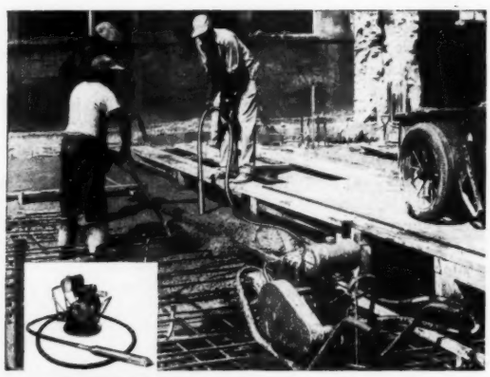
To get work started as soon as possible on the bridge foundations, the approach fill was built up to only 1 foot above water level. At this point, rock excavation at the bank was halted, the Lorain was converted to a crane and moved out on the low approach to begin foundation work.

Drive Sheet Piling

After the old timber fender pier had been pulled out with a clamshell bucket, the area was ready for sheet piling. The 33-pound U-type piles, rented from L. B. Foster Co., were driven about 6 inches into ledge rock. A Vulcan No. 7 steam hammer suspended from the Lorain did the driving.



A difficult phase of the erection work was setting the 30-ton bascule girders. Here one of the girders is being swung into place. *C. & E. Photo*



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INITIAL PRICE IS LOWER • ALL DRIVE SECTIONS ARE INTERCHANGEABLE • ALL VIBRATOR HEADS ARE INTERCHANGEABLE • LENGTH OF DRIVE IS UNLIMITED • ENGINE OR MOTOR POWER UNITS ARE OF STANDARD MANUFACTURE • MINIMUM OF SPARE PARTS REQUIRED • BACKED BY 20 YEARS OF SUCCESSFUL USE

For FREE circular, write—

Elkhart 9 White Mfg. Co. **Indiana**

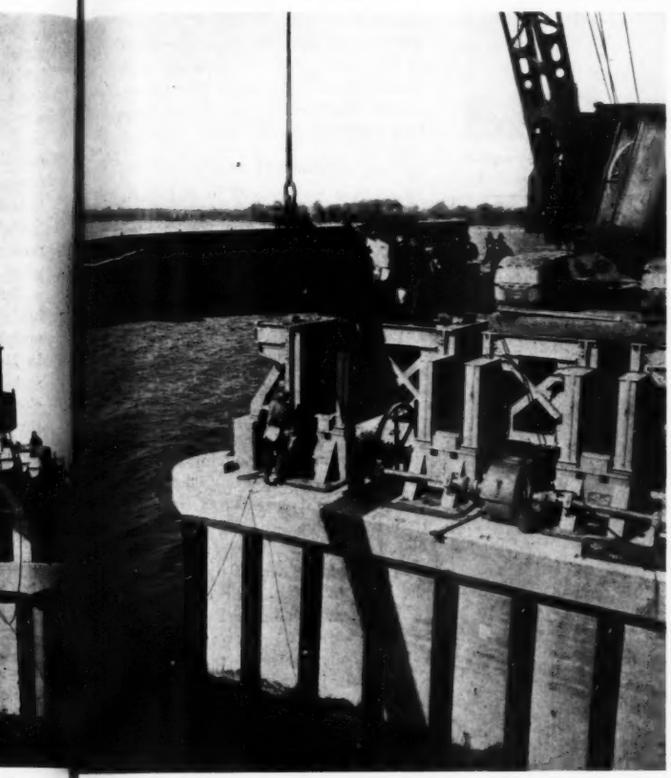
The 480 piles for each set of 2 piers were guided into position around a floating frame made up of 8 x 8's set on barrels and anchored to the fill.

After each coffer was driven, the heavy muck inside was excavated with a clamshell or with an air-lift. The contractor reported that the air-lift generally provided the easiest and quickest way of cleaning out everything inside the piling. A 14-inch Naylor pipe with a 2-inch air line reduced to 1-inch at the inlet, was suspended from the Lorain crane which moved it back and forth within the coffer. Two Chicago Pneumatic 600 - cfm compressors pumped air into the pipe forcing muck up to the top, where it spilled out through a side outlet.

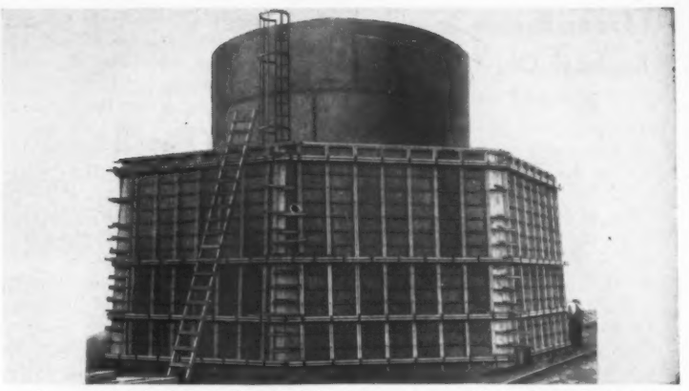
Underwater Drilling

With all the muck out, drills could now be brought up to prepare for underwater rock blasting. The contractor built a timber frame over the sheet piling, covered it with a platform, and set up the same wagon drills he had used in the shale bank on the south shore. With extra-long

(Continued on next page)



The bascule girder is carried out to the end of the bridge. American Bridge Co. used a Manitowoc Speedcrane to set heavy steel. *C. & E. Photo*



Hexagonal Tank for Chicago, Milwaukee Railroad, Ragnar-Benson, Chicago, General Contractor

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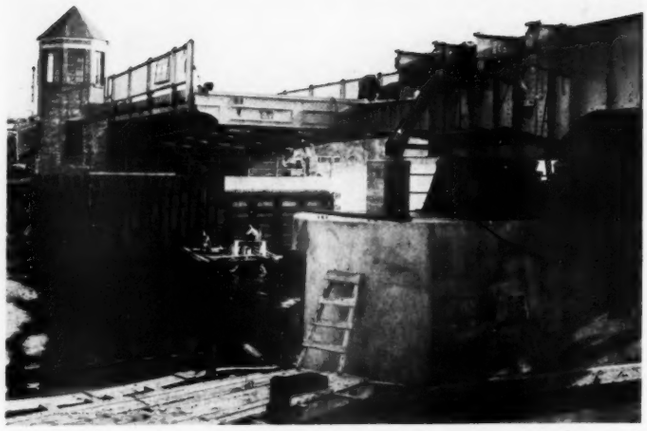
Modern Bascule Span Replaces Old Truss

(Continued from preceding page)

steel he drilled 4½-foot-deep holes on 2-foot centers. A pipe was used around the steel to keep muck out of the hole during and after drilling.

To get the dynamite down into the holes and keep it there, the contractor devised his own cartridge device. The explosive was removed from its standard cylinder-container and packed into a 1½-inch iron pipe. Caps were placed in a predrilled hole at the middle of the pipe. This method required no special equipment, and kept the charge in a cartridge that could easily be handled and set into the hole.

After 8 holes were loaded, the charge was set off and the loose rock excavated by clamshell. Divers were sent down inside each of the coffers to check grade and cleanliness.



Two of the 30-ton bascule girders in place. At the left is the operator's 2-story octagonal tower. *C. & E. Photo*

Tremie Pours

After the rock cut for the footing was prepared, the networks of steel reinforcing were fabricated on the site and lowered into place. The wood frame and platform previously used to support the wagon drills was set up again to hold tremie pipes. Five 1-foot-square pipes were each suspended from a 30-inch-square hopper set in the frame. The pipe was made up of 5-foot sections bolted together and sealed with asphalt. Six yards of concrete was first placed in one pipe, and then the operation repeated on each pipe down the line. This system kept the concrete level in the footing as the pouring continued. All footing pours were monolithic. The largest was 16 feet deep and took 657 cubic yards.

Concrete Mix

Concrete was mixed in a 1-yard Knickerbocker mixer. Sand and aggregate purchased from local quarries was stockpiled on the north shore and batched with a 2-compartment bin. The 1-2-3¼ mix had air-entrained cement. All underwater concrete used 7½ bags of cement per yard and top concrete took 6 bags. Water was taken from the lake.

After all underwater concrete was placed for the footing, preparations were made to begin pouring the pier stems. Cinders were dumped outside the piling, and wheat was funneled into the joints. Joshua Davis, the General Superintendent, claims that a little ordinary wheat dropped into the joint through a small funnel does a first-class job of sealing out the water.

The coffers were usually dewatered in half a day using a combination of 3, 4, and 6-inch pumps. Because the piling enclosed both bearing-point and intermediate piers, work on the 6-foot-square concrete tie beam was done in the dry. Pier stems were formed with ordinary timber, and concrete was placed with a bottom-dump bucket. About 2,050 cubic yards of concrete were used in the piers.

Abutments on Piles

While pier work was going on, rock excavation was started again and fill deposited on the approaches. When the embankment at the bridge site had reached the required height, pile driving began for the small fill-supported abutments. These are 47 feet long, approximately triangular in cross section, and without wingwalls.

The 8-foot-wide base is set on 3 lines of treated timber piles. The 12 piles in each of the 2 front lines are plumb, and the 12 in the rear line are battered. Piles are about 40 feet long and have 8-inch tips.

To speed driving, the contractor converted the old timber sheet-piling frame into a guide which held all 24 plumb piles at once. The method provided easier and more accurate driving.

With the piers and abutments complete, 2,000 yards of riprap were laid around embankment ends and work continued on approaches. By May, 1951, however, neither the steel machinery nor the structural members had arrived, and the job was closed down. The stalemate continued for 1 year until activity

Before buying a new truck, you carefully consider all factors related to the job you'll want your truck to do . . . every road and load condition . . . everything that affects your particular operation.

You specify the "make" of truck . . . the type . . . the power plant . . .

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Among the more than 110 Fuller Transmission models for every heavy-duty job—there is a "proved in service" unit to fit *your* job . . . designed to operate quietly and dependably . . . profitably . . . and built to stand up under the most grueling conditions, on or off the highway.

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FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • WESTERN DISTRICT OFFICE (SALES & SERVICE—BOTH DIVISIONS), 1060 E. 11th Street, Oakland 6, Calif.

resumed in August, 1952. In fact, the superintendent reported that he built another bridge in the interim.

The 2 wagon drills were sent up from a completed job in southern Vermont, and work started again on the approaches. The plans called for a 24-foot-wide surface course of 2½-inch-thick crushed stone, mixed-in-place with cutback asphalt. Shoulders are 7½ feet wide and slope at ¾ inch in a foot. Side slopes are at a 2 to 1 slope.

Steel Erection

Steel erection also began in August, 1952. American Bridge Co. used a Manitowoc Speedcrane with 60-foot boom to set all heavy steel. Work was completed first on the south side of the bridge to permit pouring the concrete approach-deck. The toughest phase of the erection work was setting the huge 30-ton bascule girders and the opening machinery units.

Machinery

The electrical equipment consists of two 20-hp wound rotor motors, controlled by a semimagnetic control system together with means for locking the 2 bascule leaves in place in the closed position. It also includes auxiliary brakes capable of holding the leaves in any position. Traffic and navigation lights, traffic gates with warning bells, and a navigation siren complete the system.

The equipment is interlocked by relays, limit switches, contactors, etc., so that only the following sequence of operation is possible to open the span:

1. Set warning bells and lights
2. Lower traffic gates
3. Pull center lock
4. Release brakes
5. Open span

The reverse sequence applies when closing. All controls were supplied by Westinghouse.

Personnel

The job will be completed about July 1 this year. Joshua Davis was Superintendent for Lambert Construction Co. Charles Plumb was Resident Engineer for the Vermont Department of Highways, of which Hubert Sargent is Chief Engineer.

Compressors and Pumps

A line of compressors and centrifugal pumps are cataloged in a folder from the Pennsylvania Pump & Compressor Co., Easton, Pa. Among compressors shown are horizontal, single-stage, and stationary units that handle air, propane, methane, butane, and other gases. Steam-driven compressors offered are basically these standard units with steam cylinders added. A line of steam booster compressors that compress steam to a higher pressure and temperature is also available.

Another group, the Oilfreair and Oilfregas compressors have pistons that run without oil or lubricant so that they deliver air, gas, or steam free of oily vapors.

Centrifugal pumps include single-suction units that range in capacity up to 900 gpm. The line also offers double-suction, single-stage and multi-stage pumps.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 183.

Ammonia Whiteprinter

A new ammonia-type whiteprinter that duplicates tracings, drawings, layouts, records, and charts is offered by Peck & Harvey, 5650 N. Western Ave., Chicago 45, Ill.

The new Speed Master Model S uses a 2,000-watt high-pressure Vicor-jacketed glass lamp and the dry ammonia-fume method of diazo reproduction. Printing speed is from 6 inches to 14 fpm. The reproduction develops fully at 8 fpm. A blower system cools the contact-glass surface to protect originals.

The machine handles cut sheets or roll stock up to 42 inches wide in any length. It has a visible, controlled ammonia-feed. A separate switch controls the ammonia-fume venting blower. A variable temperature control adjusts for different weights and grades of sensitized materials.

For further information write to the company and request bulletin 52S12, or use the Request Card at page 18. Circle No. 190.

Reflectorized Signs

An acrylic plastic reflecting material is used in signs described in a catalog from the Reflexite Corp., 114 Manhattan St., Stamford, Conn. Reflexite has no external glass beads or paint to wear or weather away. The reflective lenses are an integral part of the surface.

The booklet shows a variety of stock and gives examples of signs that can be made to order in a variety of styles from individual letters and numbers. Standard regulatory and traffic warning signs, speed regulation signs, and street name signs are shown. School signs and alignment and exclusion signs are among non-reflectorized items.

The company also offers a line of delineators, barricades and emblems, available in various colors. Other products are a premixed reflective marking compound with a pigmented binder, and a number of sign accessories.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 315.

Which Meets Your Needs Best?

CARDOX - HARDSOCG DRILLS

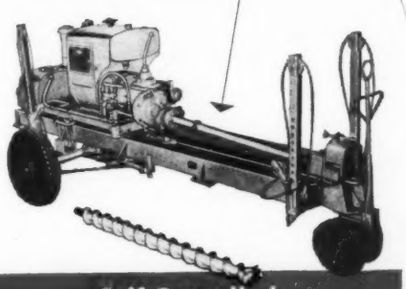
speed up and cut costs on many kinds of drilling

Tractor Mobility in an Economical One-Man Operated Unit

TRACTOR MOUNTED VERTICAL

Multi-Use Unit Saves You Time on the Job —and Between Jobs

Especially designed for jobs that require maximum mobility and fast drilling of many holes. The carefully engineered, rugged drill unit is driven by the standard farm type tractor. The auger is raised, lowered and fed into the work by a built-in hydraulic cylinder. Handles augers up to 6 inches or more in diameter. Augers are in 6-foot sections, available with any standard connection, for extension to any desired length. Augers can be added in just a few seconds



Self-Propelled HORIZONTAL HYDRAULIC

You'll drill more holes per day with this highly mobile unit, because you spend *more* time drilling, *less* time moving from hole to hole. Saves money, too,—you don't have to tie up a truck to move it. Has 32-H.P. air-cooled gasoline engine with power take-off and hydraulic pump. Augers are driven into the bank by a hydraulic piston. Standard auger equipment includes seven 6' sections (42' total) for drilling holes up to 6" diameter. Wheels and axles can be easily removed to permit low level drilling.

STANDARD VERTICAL

Ideal for drilling blast holes or doing exploratory work in clay, gypsum, asbestos, shale, and other materials.

Simple, rugged and very easy to use. The weight of the engine forces the auger and cutter head into the material being drilled. Large hand wheel raises and lowers the power assembly easily. Mast can be lowered when moving unit. Available with 6½ H.P. or 12 H.P. air-cooled gasoline engine. Standard auger equipment includes 6-foot section for 2½" or 3" holes. Other sizes also available.

LET YOUR CARDOX DISTRIBUTOR OR REPRESENTATIVE HELP YOU WHENEVER YOU NEED ANY KIND OF DRILLING EQUIPMENT

CARDOX CORPORATION

WAREHOUSES

State Repairs Pavement Ruts With Heating and Blading Unit

A Clarkmoore heater-planer is being used by a North Carolina State Highway crew to plane the rough corrugated bituminous surface of U. S. 1 near Henderson, N. C. *C. & E. Photo*

• RUTS and corrugations that heavy traffic formed in North Carolina's primary asphalt highways are now being repaired with combination heating and grading machines. Three Clarkmoore heater-planers were acquired recently and are being used chiefly in the eastern part of the state where heavy-axle loadings have caused irregularities in pavement surfaces, especially on hills.

Basically, the operation consists of applying heat to the pavement to soften the surface sufficiently permitting planing by two blades.

A fuel-oil burner throws a flat flame into a heating hood, deflecting the heat to the pavement. The 2-section planing blades behind the hood cut up to ¾ inch from the surface and windrow the material between the rear wheels. Deep ruts and corrugations require a second and often third pass.

The North Carolina State Highway Commission operates each unit with a maintenance crew consisting of 1 foreman, 2 flagmen, and 6 laborers. The windrowed material is bladed to the shoulder with a light motor grader or loaded into a dump truck for patching work or wasting. Crews average over ¼ mile of road per day when covering the full 20-foot width. Six passes are usually required to cover the full width. Double passes are sometimes required to level the high spots that form in the middle of each lane between the normal tire paths.

The unit is powered by an International engine and can travel from 12 fpm to 11 mph. The turning radius is 25 feet.

The boxed frame is made of steel, with the fuel-oil tank located centrally between the side members. The moldboards are 12 inches wide and ¾-inch thick. Cutting edges are 6 inches wide and ½-inch thick. The maximum cutting width is 6 feet.

The complete unit is 5 feet 2 inches wide in front, 6 feet wide at the rear, and 25 feet long.

Pneumatic Pipe Driver

A pneumatic pipe driver that gets its power from any standard paving breaker is made by the Atlantic Steel Co., 1775 Broadway, New York, N. Y. The Atlantic pneumatic pipe driver can be used for driving pipe under abutments, highways, and lawns. The manufacturer points out that the device saves the cost of breaking up sidewalks, pavement or turf, and also eliminates trenching, back filling, and resurfacing.

The tool consists of three parts—the driving point, the driving head, and the driving shank. Before use the driving point is inserted in one end of a length of pipe, the driving head in the other, and the shank in the pavement breaker. The universal joint action between the driving head and the shank widens the working angle for working in small spaces.

The device will drive pipe up to two inches in size at speeds up to 25 feet per hour through ordinary soil. The pipe driver weighs 8 pounds. It is made in standard sizes to fit from 1 to 2-inch pipe and in special sizes to fit extra heavy pipe. The shanks are made in 1⅛ and 1¼-inch hexagon sizes to fit standard pavement breakers.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 313.

SOIL COMPACTION. The powerful, new, self-propelling JACKSON COMPACTOR, with 12" to 24" interchangeable bases, achieves specified density of granular soils in 8" to 10" depths at 2400 sq. ft. per hr. Perfect for bridge and pipeline fills, concrete floor sub-bases, etc.

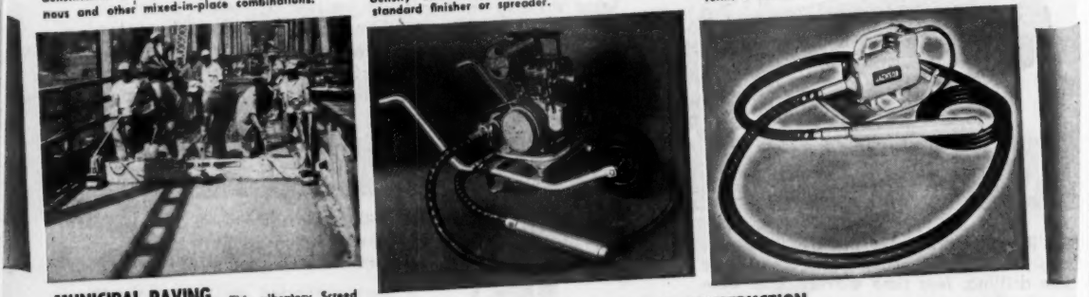
BLACKTOP WIDENING & PATCHING. The same machine, operated from power plant on auto-trailer with pickup for Compactor, is most efficient means of blacktop pavement widening and patching; paving walks, drives, etc. Compacts 2400 sq. ft. per hr. close to maximum density.

WIDENING STRIP SUB-BASES. Self-propelling tandem COMPACTOR (12" to 24" wide) will provide specified density in one pass. Controlled by spreader operator. No extra labor required.

MACADAM DENSIFICATION. Multiple COMPACTOR units, up to 12 ft. wide and tailored to fit job, provide a faster, better means of macadam densification and consolidating sand-gravel-bituminous and other mixed-in-place combinations.

HIGHWAY & AIRPORT PAVING. New, super-powered JACKSON PAVING TUBE gives full width internal vibration through full depth of the slab. Saves time, cement; provides greater density and compressive strength. Attaches to standard finisher or spreader.

SIDE FORM VIBRATION. Works equally well mounted ahead of finisher screed or in rear of spreader. Controlled by finisher operator, it saves better part of two men's labor. Will not snag forms or reinforcements, or penetrate into sub-grade.



MUNICIPAL PAVING. This vibratory Screed strikes off to all crowns, undercuts at curb or sideform, works right up to and around obstructions. Only screed that can be rolled back for second passes on 4 rollers. Most productive and convenient screed made.

GENERAL CONSTRUCTION
(Left): 6 H.P. engine-driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right): 2½ H.P. electric vibrator (for light-socket operation). Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.

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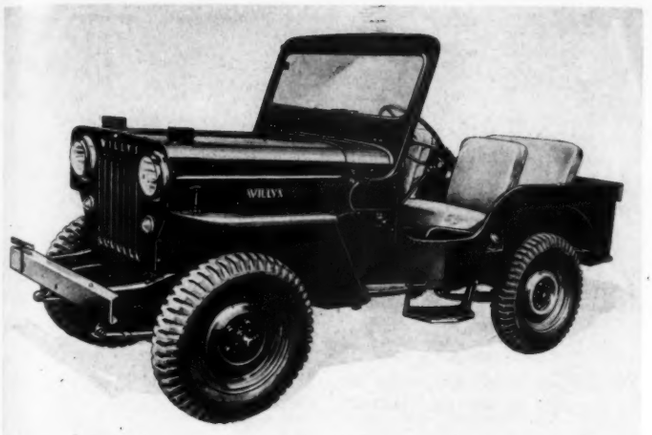
LUDINGTON, MICHIGAN

DUAL CURRENT PORTABLE POWER for operating all JACKSON machines and lights. 2.5 to 7.5 KVA, providing both single and 3-phase 60 Cy. 120 V, AC (120/240 V in larger models). Permanent magnet generators require no adjustment or maintenance.

MASS CONSTRUCTION. The JACKSON VS-4 Vibrator has no rival in economically and efficiently placing mass concrete in dams and similar construction.



The CJ-3B Jeep, a new civilian model, has a higher profile and revised cowl and windshield lines. The Jeep's new engine has a maximum brake horsepower at 4,000 rpm of 72, an increase of 20 per cent over the rating of previous models, including the army Jeep of World War II. For further information write to Willys-Overland Motors, Inc., Toledo 1, Ohio, or use the Request Card at page 18. Circle No. 177.

New Flashing Material

A new impermeable sheeting for flashing, membrane waterproofing, and pipe and duct wrapping is announced by Rubber & Plastics Compound Co., Inc., 30 Rockefeller Plaza, New York 20, N. Y.

Properties of H-D Nervastral Seal-Pruf include high mechanical strength, tear resistance, bursting strength, and flexibility at below-zero temperatures. It is said to be unaffected by acids, alkalis, dry and wet rot, and does not bleed or stain.

For further information write to the company and request Bulletin 108, or use the Request Card at page 18. Circle No. 270.

Concrete-Plant Facilities

A booklet describing concrete plants that are custom-made for particular local conditions is available from the Butler Bin Co., Waukesha, Wis. Among installations shown are ready-mixed concrete plants; central-mixing units; batching plants; and plants for making bulk cement, sand and gravel, and concrete products.

Another company product is the Carscoop, a self-contained front-end-loader that works in confined quarters. A variety of portable concrete hoppers, weighing batchers, and gates are also shown.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 316.

Case Is Assistant Manager

L. M. Case has been named Assistant Manager of rock drill sales for Le Roi Co., Milwaukee, Wis., manufacturer of internal combustion engines, and construction and mining equipment.

New Drafting Compass

A new compass is announced by the V. & E. Mfg. Co., Box 950 M, Pasadena 20, Calif. The Vemco Speed-Bow draws circles from ⅛ to 10 inches in diameter. Coarse settings are made by a finger-pressure release and the fine adjustments by a thumb screw.

This instrument is equipped for use with pencil and four types of pen attachments. With the addition of two needle points it becomes a divider, capable of scribing on steel.

For further information write to the company, or use the Request Card at page 18. Circle No. 185.

Timber Facts and Fallacies

A new booklet that lists dozens of misconceptions about timber and timber construction is available from Timber Structures, Inc., P. O. Box 3782, Portland, Oregon. "Fact or Fiction" is the compilation of a feature that has appeared regularly in the company's house organ, *Tim Press*. The booklet offers the facts for every fallacy it discusses.

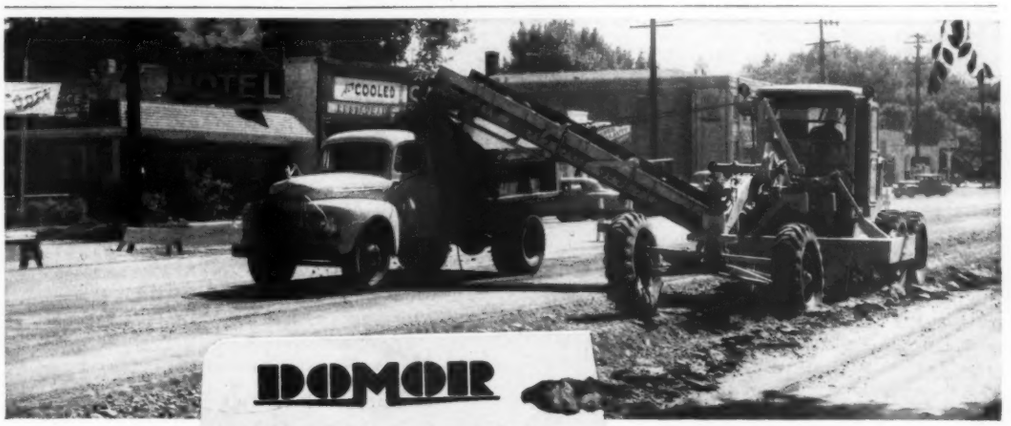
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 171.

Mighty Generator with 4.8 H.P. gas engine providing 2000 watts of electrical power.

PIONEER GENERATORS
where and when you need
PORTABLE POWER!

Pioneer Generators with gasoline engines give *quick*, portable power and light for your every day needs. Experience of 20 years in building outstanding generators prove that PIONEER Generators are properly engineered, and *ruggedly constructed*. Priced *economically*. Write today for illustrated catalogs and prices on 500 to 5000 watt PIONEER Generators. They can save you time, work and money!

PIONEER Gen-E-Motor Corporation
5832 West Dickens Avenue, Chicago 39, Illinois



Cuts and loads all material on street widening!

▸ *Gibbons and Reed Co. of Salt Lake City, Utah* put their Domor Elevating Grader and Caterpillar No.12 Motor Grader *to work* on this North Temple Street widening project.

Material was hard packed gravel and clay base with oil mulch surface. The Domor disk cut through the dense base with little trouble and gave Gibbons and Reed Co. the *one-machine, one-operator* loading performance this traffic-maintained job required.

Domor Elevating Graders are being used by many contractors and governmental units for cutting and loading black top, asphalt and macadam surfaces. The Domor Elevating Grader and Caterpillar Motor Grader team up to make easy work of these hard-to-load materials.

Talk to your Caterpillar-Domor dealer about the many jobs the Domor Elevating Grader can handle...

DOMOR Ulrich Products CORPORATION
ELEVATING GRADERS ROAD WIDENERS SNOW BLOWERS
ROANOKE, ILLINOIS

Rust-Paint Colors

Addition of three new colors to its anti-rust paint line is announced by the Paint Corp. of America, Fidelity Bldg., Cleveland 14, Ohio. Formerly available only in black, clear, and aluminum, PCA paints are now also furnished in light gray, oxide red, and chrome green.

The manufacturer states that the paints can be applied right over rusty surfaces without wire brushing, scraping, or sandblasting, and without the use of a primer coat of any kind. They may be brushed, sprayed, or rolled on.

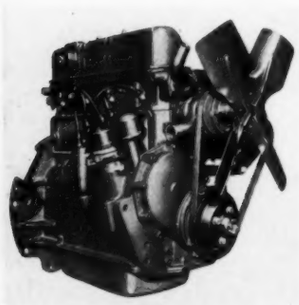
For further information write to the company and request Bulletin L-7287, or use the Request Card at page 18. Circle No. 212.

Booklet on Explosives

A new booklet that discusses two types of lower-cost explosives is offered by the Hercules Powder Co., 915 King St., Wilmington 99, Del. The Herconite series are ammonium-nitrate dynamites that are said to economically replace nitroglycerin and extra dynamites. The Gelamite series are semigelatins that can be used in place of gelatin or gelatin extra explosives. Both types are said to have high cartridge counts and to deliver explosive energy equivalent to that of the dynamites and gelatins they replace at lower costs.

The booklet details properties of the explosives and describes the packagings available.

To obtain this literature write to the company, or use the Request Card bound in at page 18. Circle No. 193.

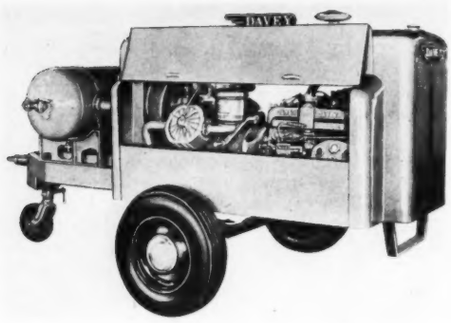


The new 4-cylinder overhead-valve Ford 134 engine develops 45 bhp at 2,400 rpm. It has a 3.4375-inch bore and a 3.6-inch stroke to reduce wear and improve fuel economy. For further information write to the Ford Motor Co., Dearborn, Mich., or use the Request Card at page 18. Circle No. 191.

Portable Compressor

A new 210-cfm compressor on a 2-wheel trailer is announced by Davey Compressor Co., North Water St., Kent, Ohio. The Super Chief Model 210-WDS is 145 inches long, 62 inches high, and 75 inches wide. The unit weighs 3,400 pounds.

The compressor unit is of W-series design and has the Davey multi-port valves. Use of these valves is said to increase the amount of air delivered per pound of fuel 15 to 25 per cent. The manufacturer also states that the valves do not carbon or foul. Engine is of Hercules 6-cylinder design with a power surplus of 25 per cent.



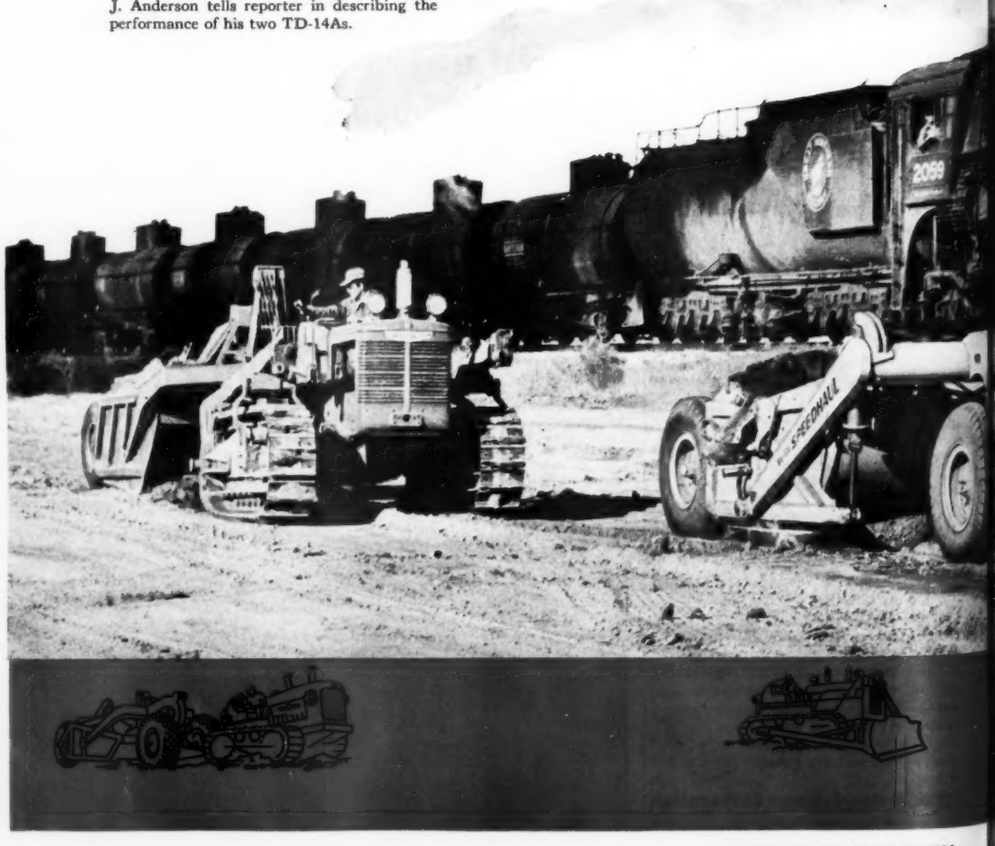
Davey's new 210-cfm compressor.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 250.

Hustles with t

Railside commercial site prepared fast by pair of International TD-14As

"THEY'RE POWERFUL AND FAST," owner Harold J. Anderson tells reporter in describing the performance of his two TD-14As.



Portable Arc-Welder

A portable electric arc-welder is announced by the Royal Equipment Corp., 906 Main St., Burbank, Calif.

The Royal Arc is a 110/220 hand-portable welder that has a heat range of 15 to 200 amps. Electrodes used are from 3/64 to 5/32 inch.

Over-all length of the welder is 10½ inches, the width is 7 inches, and depth 6¼ inches. Shipping weight is approximately 65 pounds. The welder will weld, braze, solder, cut, or preheat using either the metallic arc or carbon arc process.

For further information write to the company, or use the Request Card at page 18. Circle No. 217.

Regular checking of maintenance keeps your equipment working profitably.

This saw blade, Model AKSC, is a product of Wright Power Saw & Tool Corp., Stratford, Conn.

New Power-Saw Blade Has Hard Chrome Edge

A new version of the twin reciprocating-type saw blade used on the Wright pneumatic saw is said to be semi-self-sharpening. The Sabre saw blade tends to sharpen itself as the saw-blade steel wears away under a new cutting edge of hard chrome. When it becomes necessary to refile the saw blade, it can be done without special saw-filing skill. Without separating the blades you file straight across the front face of the teeth. There are no raker-advance or bevel angles to watch.

The new blade is said to be lighter, and to cut 15 per cent faster than previous types. It will do ripping and angled cuts, as well as crosscutting. It can also make circular cuts in a radius as small as 12 inches.

The new blade, designated Model AKSC, will be standard equipment with the company's pneumatic saws.

For further information write to the Wright Power Saw & Tool Corp., 292 Longbrook Ave., Stratford, Conn., or use the Request Card at page 18. Circle No. 237.

h the Pay Load

"My TD-14As self-load six pay yards and deliver it faster than any crawlers the same size on the market."

That's the flat statement of contractor Harold J. Anderson, out on the job where his tractors are filling and leveling a building site at Minot, N. D.

Whatever size of crawler fits your needs, there's an International model that'll come through with power, maneuverability, and good steady work, day in and day out.

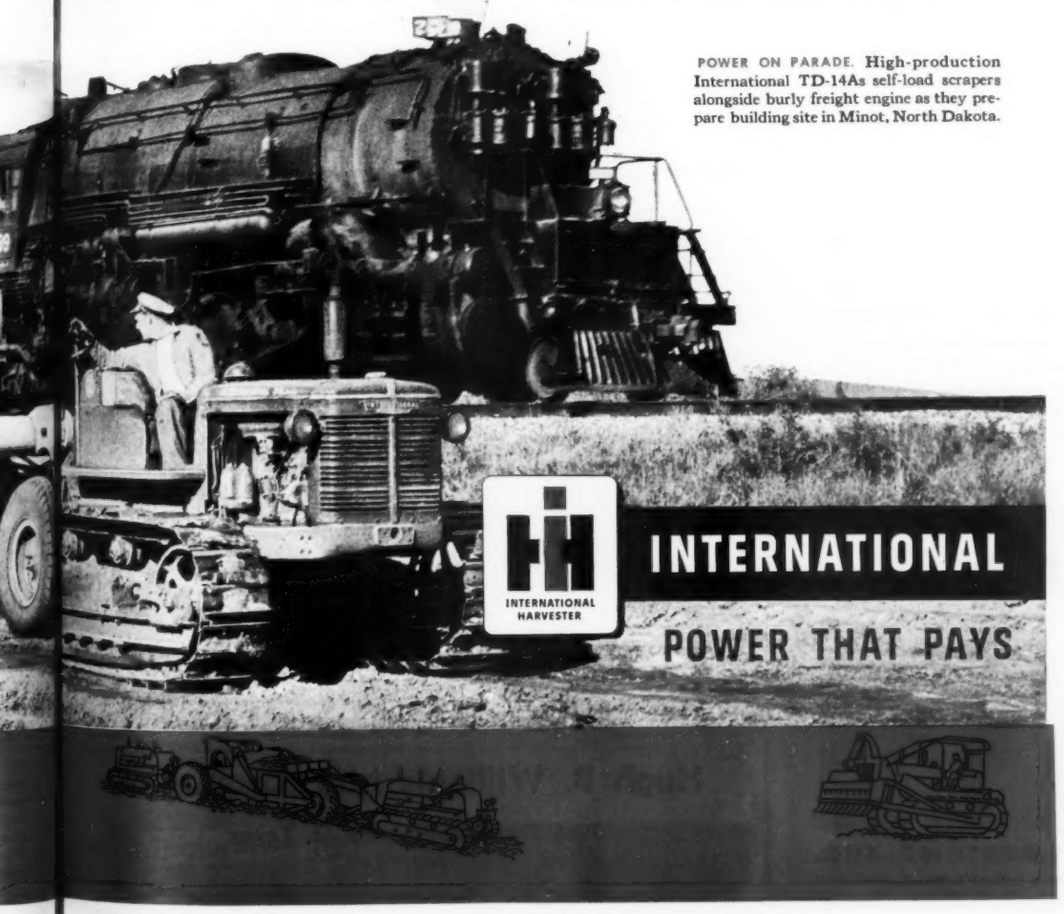
Here's what Anderson says on this point:

"I've been using Internationals for four years with very low maintenance and operating costs. In fact, my first International ran three full years with no downtime for repairs."

This kind of report comes from contractors all over the country—proof that International builds real dirt-moving machines that stand the gaff.

So see the International Industrial Distributor located near you. He has the full line of International crawlers—and as a nearby source of parts, trained servicemen and complete shop facilities, he can help keep your equipment easy on the overhead for years to come.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



POWER ON PARADE. High-production International TD-14As self-load scrapers alongside burly freight engine as they prepare building site in Minot, North Dakota.

New Flagging Tape

A flagging tape that is said not to fade in any weather conditions is made by The Visking Corp., P. O. Box 72, North Little Rock, Ark. Visking tape will take writing easily, will not rope, ravel or become brittle, and is non-toxic.

Colors available are red, orange, blue, yellow, and white. The tape is supplied on a handy core that hooks over the belt.

For further information write to the company, or use the Request Card at page 18. Circle No. 251.

Bar-Bending Machines

A new bulletin on bar-bending machines is available from the Wm. K. Stamets Co., Jenkins Arcade Bldg., Dept. BB, Pittsburgh 22, Pa. The Stamets machines it describes bend metal bar stock ⅜ to 1 inch in diameter. Bends can be made to a minimum of 7⅜ inches apart operating at a rate of ten strokes per minute.

The new bulletin illustrates the benders and includes construction details and specifications.

To obtain this literature write to the company and request Bulletin No. 100-F, or use the Request Card at page 18. Circle No. 290.

Aeroil Personnel Changes

Several new appointments have been announced by Aeroil Products Co., Inc., S. Hackensack, N. J., manufacturers of construction and road equipment, cleaning and plastic dip tanks, steam cleaners, and traffic-line markers.

John Carrino was named Manager of the company's new branch office in S. Hackensack; Robert Willems of Chicago, Ill., is Midwest Regional Manager, directing activities of offices in Chicago and Dallas, Texas; Pacific Coast Regional Manager is Deryl Yundt of Los Angeles, Calif.; Chet Mattison is Branch Manager at Los Angeles; and James Savino is East Coast Regional Manager.

Steel Pile Cells F

Great Lakes Carbon Corp. Builds 887-Foot Dock for Mec
Loading on Mississippi at St. Louis, Mo.

By L. H. HOUCK

• FINDING the best location for barge-mooring cells on the Mississippi's muddy bottom was but one of the problems in constructing the 887-foot dock for the Missouri Coke and Chemical Division of the Great Lakes Carbon Corp., New York, N. Y. at its St. Louis, Mo., plant.

The dock consists of 8 steel sheet-piling mooring cells, 43 feet above the water line and based in solid rock 20 feet below the river's bottom. These cells and two other 16-foot supporting cells are 20 feet 4 inches in diameter. The main base for the material-handling machinery is a 46-foot-diameter cell. The dock provides facilities for mechanical unloading of coal barges and the barge loading of coke, the main product of the St. Louis plant.

River Contour Problem

Many problems had to be considered before the cells could be properly located: they had to stay within the Federally prescribed harbor lines; the water must be deep enough at the dock for barges with a 12-foot draft at all river stages; and cells must be founded on solid rock to withstand the mooring stresses.

All existing data on river stages and bottom contours was assembled and studied by Great Lakes engineers. The bottom contour in the dock area was checked with a Bendix sonar outfit in the final step. Jet borings were made to get ground structure data.

When river stages for 50 years were examined, it was discovered that a difference existed between the readings at the Market Street gage station and the river at the dock location near the county line in the southern part of St. Louis. This was due to a narrower river at the gage station and a wider river at the dock, making a difference of 3 feet

A view of the completed cells looking upstream: each cell is equipped with rings for hawsers and ladders for climbing.

GarWood 75

New Cranes Designed for More "On the Job" Time!

Handle all types of precision steel erecting, concrete work and any crane, clam, magnet or dragline job with the new standard-duty 75A or heavy-duty 75B Gar Wood cranes! . . . Collapsible high gantry simplifies raising of longest booms . . . Pendant cables speed changing of boom lengths . . . Optional *power load lowering* and *fluid coupling* give smoothest possible crane operation . . . Hammer head boom point keeps cable away from boom — gives added boom strength — keeps cable costs low . . . Crane sections pin and bolt connected for rigidity and strength . . . Right angle drive, power actuated hoist clutches and conical hook rollers . . . Easily converted to all attachments including the new, exclusive Gar Wood Foundation Borer!

FOR LIFTING POWER with MOBILITY

A Gar Wood 75BT truck crane will do the job. Lifts up to 40,000 lbs. Has all the heavy-duty features yet gets around fast. Ideal for long boom and steel erection work.

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Findlay Division • Executive Offices • Wayne, Michigan

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If You Have Jobs That Require Equipment for Drilling Holes of the Following Size Range

8 in. to 72 in. diameter
and
10 ft. to 45 ft. in depth

WRITE, WIRE OR PHONE

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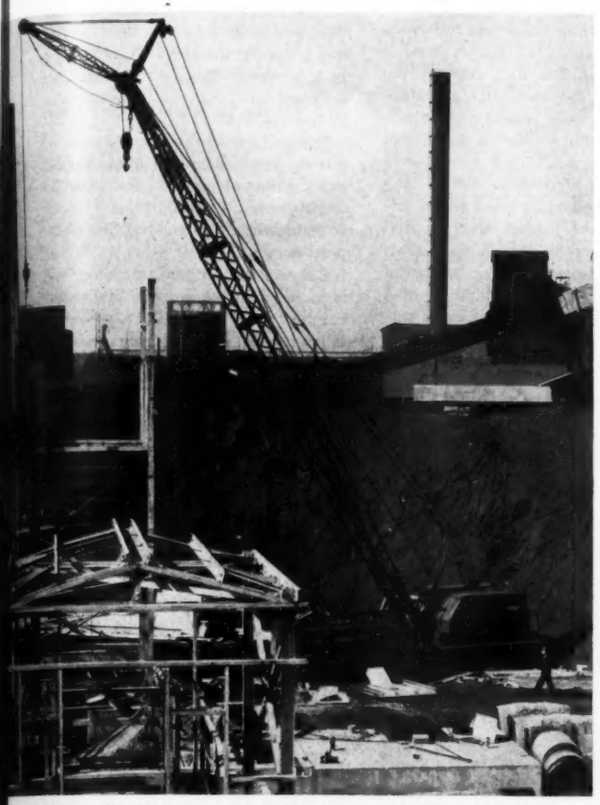
2946 Oak Lane — Dallas, Texas

Barge Mooring



A Bucyrus-Erie 151-B crane, with an 85-foot boom and 15-foot jib, handles steel for the shore structures of the 887-foot dock at St. Louis, Mo.

lower on a 40-foot stage at Market Street. A graph was made to show the variation factor which, as it turned out, was different for different river stages.

The problem of ice in the winter had to be considered. It was discovered that most of the ice in the Mississippi, which was held above St. Louis by the locks, came from the Missouri, and the current caused it to eddy across from the Great Lakes dock to the east side of the river.

Cell Construction

Dravo Corp.'s Contracting Division, Pittsburgh, Pa., which had the cell construction contract and started work on October 1, 1952, finished its part in January. It moved in a part of its large water fleet for the job, including barge-mounted steam crane No. 18, service barge No. 607, barge-mounted steam crane No. 14, and other floating equipment.

Test piles of 12-inch H-beams with pointed ends were driven into the limestone bedrock as a check on uncertain jet borings which had been made at each cell location. On one cell the test piles struck a 12 to 18-inch shelf of rock several feet above bedrock. Beams were forced through and the shelf was used later as an anchor for the steel sheet piles which followed. On another location the test piles went through an ancient sunken barge.

Dravo drove these piles and later sheet steel enclosures for the cells with a McKiernan-Terry 9-B-3 hammer.

A wooden template was built for locating positions for interlocking steel sheet piles. Four sleeves in the template accepted H-beams which were used as spud piles to anchor the floating template in place. It was used for all the 20-foot-diameter cells and a special one was made for the 45-foot-diameter cells.

The 20-foot cells contained 48 MP-112 steel sheet piles interlocked in a circle. The 46-foot cell contained 107.

Tops were all leveled off at elevation 420 feet which is 5½ feet above the highest recorded river stage. The lengths to the limestone bedrock varied but averaged 75 feet.

For instance, No. 4 cell, 46 feet in diameter and used as a foundation for the unloading machinery, is 85 feet on one side and 68 feet on the other because of the slope of the

(Concluded on next page)

New Selector and Comparison Chart for AMSCO Hardfacing Products...

Get this completely, revised up-to-date chart showing you what Amsco Welding Rod to use for licking your wear problem.

Ask your Amsco representative or send the coupon today.

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Please send me the Selector and Comparison Chart for Amsco Hardfacing Products.

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389 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

ANOTHER GW PRODUCT

GarWood 75

A New 3/4 yd. Shovel with Many Exclusive Features!

Gar Wood has designed the *new* "75 series" shovels to combine many new and exclusive operating features with time-tested standards of advanced design and rugged construction . . . Both the standard-duty 75A and the heavy-duty 75B have *power actuated mechanical drum clutches, right angle drive, independent chain crowd, power steering, independent travel, conical hook rollers* to eliminate rocking and an optional *hydraulic coupling* to absorb shock loads . . . Easy field conversion for crane, clam, dragline, magnet, pile driver or trench hoe work . . . Don't miss checking the profit potentials of the exclusive new Gar Wood Foundation Borer — the machine that bores and bells in one operation . . . See your dealer for details —

EASY CONVERSION IS A FEATURE

Your Gar Wood shovel can be quickly adapted for trench hoe work. Digs up to 17'10" depth, dumps at heights up to 19'3". Standard 40" dipper. 36", 31" and 26" widths optional.

GAR WOOD INDUSTRIES

GAR WOOD INDUSTRIES, INC.
Findlay Division • Executive Offices • Wayne, Michigan

F-533-1

Steel Pile Cells

(Continued from preceding page)

bedrock. Each pile went 10 to 20 feet in the mud and gravel of the river bottom before basing in rock.

After the piles were driven and leveled, the mud and gravel was clammed from the inside down to bedrock and a 5-foot layer of crushed rock ballast from the Bussen Co. quarry nearby, was dropped in the bottoms. The remainder of the cell was filled with gravel from the river bottom. Gravel bars were cleared of mud and sand and brought up with 2-yard clamshells on the steam-crane booms. River gravel was stopped within 2 feet of the tops to allow for a concrete cap.

Concrete Handling

Concrete caps of reinforced 3,000-psi concrete was part of the contract of the Fruin-Colnon Contracting Co., St. Louis. Concrete came to the job in Jaeger transit mixers on a mixed fleet of trucks of the Construction Materials Co., St. Louis.

Transit mixers chuted their loads into 2-yard concrete buckets placed on the bank by a barge-mounted Bucyrus-Erie 38-B dragline with a 75-foot boom, owned by Vollmar Bros. Construction Co., St. Louis, which swung the concrete from bank to cell. Each 20-foot cell used 24 cubic yards of concrete and the 45-foot cell took 100 yards.

Cell Functions

Each 20-foot cell was designed to resist the stress of moored barges and a maximum line pull of 12,000 pounds from twin-barge pullers mounted on cells 4 and 5. The 46-foot No. 4 cell was designed for 160-ton live and dead loads.

The twin-barge puller, made by the Clyde Iron Works, Inc., Duluth, Minn., moves barges up and down the stream by means of cables passing through sheaves on cells 2 and 8 and is capable of moving two 195 x 35 x 9-foot loaded square-end barges upstream against a 9-fps current.

Hopper and Unloader

The coke hopper on shore is a twin hopper of reinforced concrete with 1-foot 6-inch walls. Bottom level is at elevation 398 and hopper top opening at 419 feet. Being watertight, joints were sealed with 9-inch copper continuous water stops, and to retard vertical forces from buoyancy during high water, the 12-inch H-beam supporting piles were anchored to the hopper steel so that the piles could hold the hopper down as well as support it. The bottom of the hopper was the beginning of a 50-foot concrete tunnel sloping upward and housing the receiving end of a 225-foot 42-inch conveyor belt, which rises 56 feet vertically on its run from river cell to the revolving-discharge spout at the river end of the loading boom.

The coal unloader, made by Clyde Iron Works, Inc., has a 3½-yard bucket on a boom and trolley capable of unloading a 50-foot-wide barge at 350 tons per hour. The bucket dumps into the coal hopper and it goes to the elevated hopper by belt, where it may be released into railroad cars or for stockpiling by a motorized gate.

Stockpiling equipment consists of a twin-powered bottom-dump Euclid truck with a sideboard capacity of 30 cubic yards and a LeTourneau Super C Tournadozer with a C-18 24-cubic-yard scraper.

Coke is the outgoing product and is handled in the reverse of the incoming coal. The coke-conveyor hoist-tower supports the boomed sections of the coke conveyor, which lays coke in barges at 200 tons per hour. The counter-weighted coke bridge, which has a 42-inch conveyor belt, pivots from the top of No. 10 cell and has a vertical range of 30 feet above cells to 26 feet below. The concrete coke pit has 1-foot, 6-inch walls, is 19½ x 34 feet on the outside, and 22 feet deep.

Barge Storage

Downstream half a mile a barge storage harbor was built where loaded barges will wait their turn at the unloading dock. This consists of 6 mooring piles, each composed of a cluster of 16 piles bolted together. Piles are 90-foot 18-inch Douglas fir creosoted-wood piles. This facility was designed to moor at least six 14,000-pound barges.

Contractors and Personnel

For the Great Lakes Carbon Corp., C. R. Binner is Chief Engineer; N. V. Brower is Engineer in Charge, St. Louis; and J. G. Nordin, Engineer of Construction. The Contracting Division of Dravo Corp. was represented by S. B. Thompson.

Fruin-Colnon Contracting Co. was represented by O. A. Ray, General Superintendent, and Paul DeRouse, Job Superintendent.

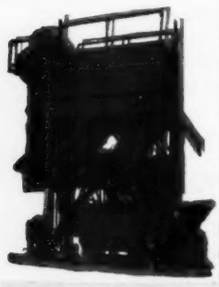
Stupp Bros. Bridge & Iron Co., St. Louis, furnished and fabricated structural steel.

Continental Boiler and Sheet Iron Works, St. Louis, fabricated the conveyors and furnished steel.

GRADATION

CONTROL

YOUR CHOICE OF TWO GRADATION UNITS



(Above) The Model 863, semi-trailer mounted for complete portability.

(Left) The Model 864, tower type for use where portability is not the prime consideration.

for the 15-35 ton-per-hour
BARBER-GREENE
840 Bituminous Plant

Never before has gradation control—plus maximum portability and the established advantage of continuous mix—been combined in this capacity range.

Two Gradation Control Units are furnished: (1) the Model 863 where portability is paramount; and (2) the Model 864 Tower Unit where portability is not so important. Being semi-trailer mounted, the Model 863 is completely portable. The Model 864 is designed in sections for easy hauling on truck or trailer. Both units screen and separate the aggregate up to three sizes (four-bin operation on tower type plant optional) . . . then accurately measure the aggregate and feed the required percentage of each size to the mixer.

53-3A-B

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Aurora, Illinois, U.S.A.

DUDGEON HYDRAULIC JACKS

SALES RENTALS
FOR:
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CAPACITY TO 600 TONS

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789 BERGEN STREET BROOKLYN, N. Y.
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Right-Angle Drive For New Power Drill

A new right-angle drive triples the range of drills by adding two more speeds to their operation. The Korner King converts ¼-inch drills of 2,000 rpm to 1,000 rpm with 80 per cent more power and reverses this gear ratio for high-speed drilling. It is offered in a kit with 10 Super speed bits.

The right-angle drive allows drilling in otherwise inaccessible locations, between joists and studs, or in tight cramped corners. Special shaft extensions for the bits permit penetration of any thickness and alignment of holes through a series of obstructions. The bits feature curved cutting blades.

For further information write to the R. C. S. Tool Sales Corp., P. O. Box 1434, Joliet, Ill., or use the Request Card at page 18. Circle No. 333.

Reduces Dust Nuisance As Truck-Mixer Loads

The dust created when loading truck-mixers at ready-mix plants can be controlled by the use of a Sly Dust Filter and a canvas hood on the truck hopper.

When the truck-mixer is loading with its hopper under the rubber spout, the weighman lowers the canvas hood by cables and pulleys so that the hood drapes itself around the hopper. As he releases the batch into the truck-mixer, the suction of an exhaust fan carries the dust through special piping into the dust filter.

The dust filter is furnished completely assembled with fan and motor mounted on top. The purchaser installs filter, hood, and dust piping. All the necessary equipment, including the dust filter with fan and motor, piping, and canvas hood are described in literature available from the company.

To obtain this literature write to The W. W. Sly Mfg. Co., 4800 Train Ave., Cleveland 2, Ohio, or use the Request Card at page 18. Circle No. 271.

Clark and Ross Agreement

Clark Equipment Co., Buchanan, Mich., and Ross Carrier Co., Benton Harbor, Mich., have entered into an agreement by which Clark will acquire the capital shares of Ross, owned by them and those other shareholders who become parties to the agreement.

Clark is manufacturer of automotive and agricultural components and produces industrial lift trucks for materials handling. Ross Carrier, of which Michigan Power Shovel Co. is a subsidiary, manufactures straddle trucks used in handling lumber, pipe, etc., and a line of power shovels and excavating equipment for earth-moving operations.

Bayard L. England Named Engineer of the Year

Bayard L. England, Vice Chairman and Treasurer of the New Jersey Highway Authority, has been named Engineer of the Year by the New Jersey Society of Professional Engineers. The honor, which is bestowed annually on an outstanding New Jersey engineer, was conferred in recognition of Mr. England's many contributions to the fields of engineering and management.

Mr. England handles all financial matters for the Highway Authority, including the $28,000,000 temporary loans and permanent financing. The Authority is now constructing the $285,000,000 Garden State Parkway.

In addition to his duties with the Garden State Parkway, Mr. England is President of Atlantic City Electric Co. and the Edison Electric Institute of America. He is a director in the State Chamber of Commerce, the State Safety Council, Vineland Training School, and the Atlantic City Chamber of Commerce.

Bulletin on Truck Crane

Their 6-ton, ⅜-yard Model T-35 truck crane is described in a new bulletin issued by Schield Bantam Co., Waverly, Iowa. Information includes mechanical specifications, dimensions, and operating data. Truck mountings and typical interchangeable attachments for the crane boom are described.

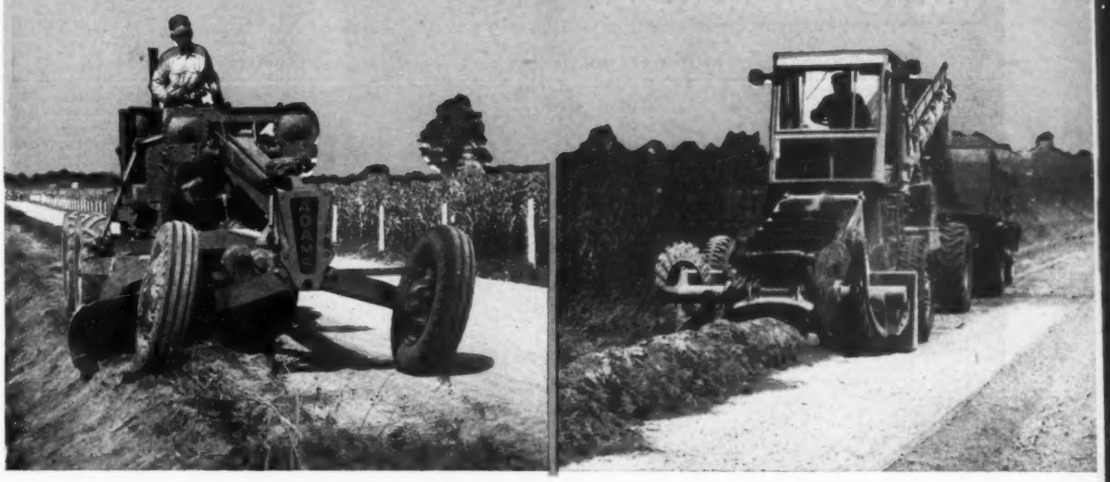
Charts show lifting capacities at various radii for both 2½ and 4-ton truck-mountings, for 25 and 45-foot booms. Over-end and over-side ratings, with and without outriggers, are included.

Among features of the new crane stressed by the manufacturer are a new power boom hoist, a heavier trunnion base, improved swing shaft, improved air-cooled clutches and brakes, and new cab.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 293.

Here, Mr. Highway Official,

is a practical, proved way to guard roads against ravages of winter weather



An ADAMS Motor Grader and an ADAMS TraveLoader Restore Good Drainage at Low Cost

Beat winter to the punch this year. Restore good drainage to your roads now—paved and unpaved—with an Adams Motor Grader-TraveLoader team . . . and watch them come through with less break-up next spring.

The Adams Motor Grader cleans out side ditches and cuts off high shoulders, quickly, easily. The TraveLoader then picks up all surplus windrowed material, loading at a truck-a-minute clip.

With good drainage reestablished, the subgrade will be stabilized and the road surface far less subject to chuck holes. There will be substantial savings in surface material, too—less filling on stone and gravel roads, less patching on blacktop and paved roads.

Yes, an Adams Motor Grader and TraveLoader make a great road-saving team—give you better, longer-lasting roads the whole year around. Ask your local Adams dealer for complete information.

J. D. ADAMS MANUFACTURING CO., INDIANAPOLIS, IND.

The Adams TraveLoader also loads efficiently from stockpiles—handles gravel, crushed stone, sand, top soil, cinders, oil-mix material, etc., with real speed and ease.

ADAMS

Motor Graders TraveLoaders Pull-Type Graders

The basis for the Bodine method of rebuilding roads is a complete mixture of sand and clay. This is accomplished by a Cleveland Model 140 trencher, powered by an International UD-9 diesel engine, that mixes all materials thoroughly as it slices through the ground.

Trencher Is Found Useful In Building Secondary Roads

• ONE of the machines considered least likely to be needed in the construction of an unsurfaced road has been a trencher, yet the unique application of this machine by a Texas farmer, recently elected County Commissioner, may provide the answer to the southwest's requirements for low-cost, all-weather secondary routes.

The use of such a machine in dirt-road building is revolutionary. Equally remarkable is the fact that sand and clay, the debit factors that turned roads into mud seas during wet weather or covered them with Sahara-like dunes during dry spells, are now assets in their new roles as raw materials for stabilized dirt roads created by the trenching machine.

Farmer Discovers Method

Originator of the new system of road building which permits year 'round safe travel at speeds of 60 miles per hour is County Commissioner J. F. Bodine, Colorado City, Texas.

Bodine credits his curiosity for giving him the original idea for "digging" roads. While driving from his ranch into town, Bodine wondered why—regardless of weather conditions—areas of road crossed by pipelines were always in good condition. Following his election as Commissioner, Bodine visited a pipeline job and after a few hours of study, came away with the answer.

In digging for a pipeline, the trenching machine cut through the light topsoil and into the heavy clay subsoil, mixing both thoroughly as they were brought to the surface. The mixture was almost a perfect dirt-road building material, approximately 50 per cent each of sand and clay that would not blow when dry, would not turn into mud when wet.

While the method proved to be ideal in the construction of small sections of road, the matter of extensive operations remained in doubt until Bodine rented a trencher from a local contractor and built a test strip a mile south of Buford, Texas.

Equipment

More than satisfied with results, Bodine first hired a trencher from a local contractor, then bought a Cleveland No. 140 ditcher powered by an International UD-9 engine from Browning-Ferris Machinery Co., Dallas, Texas.

Equipped with the trencher and two International-powered Austin Western graders, Bodine's crew of six men has rebuilt 9 miles of road in 3 months, and plans to rebuild 40

here's muscle to move mountains

IN 6 YARD BITES!

LIMA TYPE 2400—The largest member of the Lima family is engineered and constructed for heavy duty service with higher dump, greater reach, and faster digging cycle.

EASY INSTANT CONTROL — Smooth, "Precision" air control of travel and operating motions lessens operator fatigue. Anti-friction bearings, reduce power robbing friction and step up efficiency.

BIG YARDAGE PRODUCER— Maximum power and fast digging cycles originate from a husky 12 cylinder Diesel engine of approved make. Equipped with torque converter power take-off.

LOW OPERATING COSTS — Truck and rotating bases are integrally cast for extra-rigidity and long life. Adjustments rarely needed on full mechanical clutches. Easy maintenance.

Offices in Principal Cities of the World

LIMA

SHOVELS • CRANES

DRAGLINES • PULLSHOVELS

BLH

BALDWIN-LIMA-HAMILTON CORPORATION

Construction Equipment Division

LIMA, OHIO, U.S.A.

Construction Equipment Division

A TRANSPORTING ONE-BAG MIXER

FITS FORD AND FERGUSON TRACTORS

The Universal Transmix mixes, transports and dumps cement, aggregate, water and dirt. Holds 4½ to 5½ cubic feet and mixes one bag of cement, 5 to 1. Can be attached or removed from tractor in 15 minutes.

DUMPS HYDRAULICALLY

Barrel dumps from the hydraulic mechanism on the tractor. Standard 6:00 x 16 tire on barrel is friction driven from power takeoff extension. Barrel revolves on rubber wheels—no gears or chains to wear out.

WRITE FOR PRICE AND CATALOG SHEET

UNIVERSAL PULLEYS COMPANY

347 NORTH MOSLEY • WICHITA, KANSAS

While trenching operations are underway, an Austin Western 99 motor grader blades dirt toward the ditch, finally filling it.

miles more of road by this simple and effective method.

Building the Road

First step in rebuilding a road is the removal of existing fence posts and rolling up the wire that can be re-used when the project is complete. This is the job of crew members not assigned to machines. Next, the graders go to work blading the sand dunes on each side of the road toward the center. This phase of the operation is considered finished when the road center is level and the side piles of sand have been bladed down.

It is at this point that the trencher is put on the job. Cutting a ditch 5 feet deep, 26 inches wide, and 12 feet from the centerline, it throws the spoil toward the center of the road. This places a mixture of sand and clay where the graders can spread it later and also raises the crown of the road 24 to 36 inches. When the trencher reaches the end of a section being worked on, it returns on the opposite side of the centerline, throwing an equal amount of material toward the center. Occasionally, a third or fourth pass is made if more height is necessary for the road.

When the trencher has finished its work, the graders begin working the sand left at the sides of the road into the empty ditches, packing it by running their wheels over it until the trench is full of well tamped sand.

Routine spreading of the spoil banks, tossed up by the trencher, makes an excellent road surface of completely mixed sand and clay which dries rapidly after the heaviest rains. Also, since the road is raised higher than the surrounding land, the wind serves to keep it clean, and water runs off in side ditches.

One mile of road was carefully timed and the trencher took 21½ hours to throw a pile of material on each side of the center line. Nine more hours with the graders completed the work. Under average conditions, the 6-man crew can easily build a mile of road a week.

As the trencher is usually the first to finish its part of the job, the county uses the machine only part time, renting it out to ranchers for drainage or ditching work.

Traveling about ¾ mile in a 7-hour day, the trencher's International UD-9 engine uses about 10 gallons of diesel fuel per day with no oil consumption during 60-hour changes.

Low-Cost Solution

Observers of the Bodine method state that it offers a low-cost solution for clay-stabilized roads. The material moves less than 10 feet from source to final use at the rate of 4,000 cubic yards a day. Also, the open ditch provides a convenient place in which to deposit the accumulations of blow sand on each side of the road.

But of the greatest importance to these same observers is the fact that the Bodine method has developed an entirely new application for a machine without the need for a single alteration.

Identifying Decals

Literature is available on enamel decals that will transfer a trademark or identifying insignia to equipment. The decals are applied by soaking in water for 30 seconds and sliding the enamel portion on to any surface.

Storer Sign Co., 1558 So. Market, Wichita, Kans., makes up the design from specifications sent by the purchaser and submits preliminary versions for approval. Prices are figured on the basis of the size of decal, and the number of colors used.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 339.

If ever a truck was designed with the driver in mind...

this new Ford Truck is it! New "DRIVERIZED" Cab cuts driver fatigue.
New easy handling saves work and time getting around in tight spots. These and many other TIME-SAVING features in the all-new Ford Trucks help get jobs done fast.

Time is money! Today's truck owners know it. Ford Truck engineers know it. That's why TIME-SAVING was a major goal in designing the completely new Ford Trucks for 1953. With scores of new TIME-SAVING features, the new Ford Trucks are made-to-order for your work.

New "DRIVERIZED" Cabs provide living room comfort, cut driver fatigue. They help save time by making driving easier and more efficient in many ways:

Better visibility for instance. Although the new curved one-piece windshield is the most obvious improvement, bigger windows at the sides plus a 4-ft.-wide window at the rear, offer an amazing increase in all-around visibility.

The new Ford Truck seat is something special. Wider, of course. Non-sag seat springs. Adjustable seat cushion *and* separate adjustable back-rest. Most interesting new Ford exclusive feature is that every seat now has a built-in *shock snubber* to help level out the ride.

For easier maneuvering in tight quarters, or in loading and unloading, turning diameter has been considerably reduced. This was done by "setting back" the front axle, widening the front tread, and by improving the steering geometry.

New F-900 BIG JOB has G.V.W. rating of 27,000 lbs. for extra heavy hauling work. Low FRICTION 155-h.p. *Cargo King V-8* offers high sustained torque to give you more performance flexibility for your heaviest loads.

NEW "DRIVERIZED" CABS cut driver fatigue. Both Standard and Deluxe Cab (shown) have new curved one-piece windshield, 55% bigger; new wider adjustable seat; new seat *shock snubber;* new push-button door handles.

Synchro-Silent type transmissions are now standard on all of the new truck models and at no extra cost. This means faster shifting without double clutching and less truck momentum lost.

New LOW-FRICTION design reduces piston travel, cuts down friction "power waste." You get more useable power...*on regular gas.* The 145-h.p. overhead-valve Cargo King V-8 has more power per cubic inch than any engine in its class. The 155-h.p. overhead-valve Cargo King V-8 is the most powerful Ford Truck engine ever built.

And only Ford gives you a choice of V-8 or Six in five different engines.

New Ford service accessibility saves time in the shop. Front ends have been redesigned. Hoods are wider. Frames are wider, too, permitting a new fender contour that makes engines much easier to get at.

Over 190 models in a greatly expanded line give you many more Ford Trucks to choose from in order to get the one *right* truck for *your* job.

FOR COMPLETE INFORMATION on all or any of the new Ford Trucks, write: FORD Division of FORD MOTOR COMPANY, P.O. Box 658, Dearborn, Michigan. State your work and what type of truck interests you most.

Fifty Years Forward 50th ANNIVERSARY 1903 1953 *on the American Road*

FORD ECONOMY TRUCKS

SAVE TIME! SAVE MONEY! LAST LONGER!

PIPE AND TILE LOCATOR

Amazing Static Pipe & Tile Locator, detects buried pipe, tile, buffalo boxes, manholes. Requires minimum skill. No batteries or wires. Used by utilities, water departments, contractors.

Complete with instructions $5.00. Money back guarantee, if not satisfied.

MAKERS OF RED CAP SPINNER ROOF VENTILATORS

WARNER VENTILATOR CO.
240 SPRING ST., LaGRANGE, INDIANA

ASTM Annual Meeting Program Is Planned

Eight technical symposia and many other technical papers, covering a wide range of subjects, will be presented at the 56th Annual Meeting of the American Society for Testing Materials at Chalfonte-Haddon Hall, Atlantic City, N. J., from June 28 through July 3.

Throughout the entire meeting technical committees will be in session perfecting and completing work on specifications and tests already in process, or initiating new research and standardization work. There will also be a number of round-table discussions and informal sessions. The purpose of the symposia is to present the latest thoughts and applications through a series of papers by outstanding specialists in their respective engineering fields. Frequently a symposium is reviewed by a technical committee of the Society. As a rule, the symposia are later published.

Three of the symposia to be presented are: "Symposium on Significance of Tests of Concrete" (sponsored by Committee C-9 on Concrete and Concrete Aggregate), "Symposium on Lateral Pile Load Tests" (sponsored by Committee D-18 on Soils for Engineering Purposes), and "Symposium on Dynamic Testing of Soils" (also sponsored by Committee D-18).

Crewdson Represents Kuljian in Far East

Royston Crewdson is the newly appointed representative of The Kuljian Corp., Philadelphia, Pa., in the Far East. With headquarters in Tokyo, Mr. Crewdson will coordinate his firm's engineering and construction activities in the Far East. These concern the expansion of industries, design and construction of power plants, and industrial engineering studies. Another Kuljian activity is the establishment in Far Eastern countries of the company's rayon machine, which features a continuous-spinning process already adopted by a number of foreign countries.

Prior to his association with Kuljian, Mr. Crewdson spent 6 years with the American administration in Japan under General MacArthur.

Dozens of Uses • Thousands of Users

Prove Ability, Versatility of the Model D

The thousands of satisfied owners are still finding new uses for the able and versatile Allis-Chalmers Model D Grader. It has proved again and again that it has the power and capacity to do outstanding work on both construction and maintenance.

Usefulness of the Model D is multiplied by several easily mounted attachments: hydraulically controlled rear-end loader, shoulder maintainer that is interchangeable with the loader, scarifier, both V-type and blade snowplows.

MORE POWER, MANY FEATURES, LOW COST

For even greater performance ability, the Model D's power has been boosted to 40 brake hp. With its added power and many big-grader features such as tandem drive, ROLL-AWAY Moldboard, tubular frame and hydraulic blade lift — the Model D's original cost still is but one-third that of a large grader. Operating costs are low, too.

Your Allis-Chalmers dealer will be glad to demonstrate what the versatile, economical Model D can do for you.

ROLL-AWAY is an Allis-Chalmers trademark.

40 Brake hp. • 8,800 lb. (bare) • Four speeds forward to 25.6 mph., reverse to 3.3 mph.

Handles light construction on streets, roadways, etc.

Backfills ditches, packs and levels ground, loads excess dirt to trucks.

Scarifies, with plenty of down pressure, accurate hydraulic control.

Mixes thoroughly, with rolling action of ROLL-AWAY moldboard.

Cuts and cleans ditches, slopes banks, grades shoulders.

Loads sand, dirt, snow—any material — to trucks.

Finish grades between forms on road and street construction.

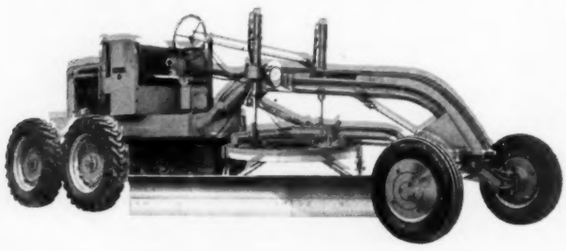
Levels for home building, parking lots, play areas, etc.

Terraces, builds diversion ditches, does miscellaneous grader work.

Loads sand, gravel, dirt, any material, with ⅜-yd. bucket.

Rough grades, spreads and cleans up on street or road construction.

Landscapes, grades lawns, slopes, ditches around housing projects.



- Designed for your jobs
- Built to take it
- Easy to operate
- Easy to service

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

Springloaded Vise

A new bench vise for pipe that operates by a spring and ratchet arrangement is offered by the Springload Mfg. Corp., 2412 Aurora Ave., Seattle 9, Wash. The vise grips when a chain is hooked around the pipe and a handle is depressed to adjust the tension. The sliding ratchet holds the handle down and keeps tension on the chain until released.

The vise is available in two sizes, one for ¼ to 2½-inch pipe, the other for ¼ to 4-inch pipe.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 299.

Data on Wire-Rope Fitting

A 4-page brochure describing its new wire-rope choker sling fitting has been produced by the Electroline Co., 4121 S. LaSalle St., Chicago 9, Ill. It shows typical applications for which the new fitting is suitable: lumber, I-beams, rods, heavy pipe, and others. There are closeup views of the optional locking-shoe device which keeps nonrigid loads tightly bound. Drawings explain operation of the fitting, and a cutaway section shows the socket arrangement into which the fitting is installed.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 340.

I-H District Changes

Several changes have been announced by International Harvester Co.'s motor truck districts.

Chauncey L. Sears has been appointed Manager of the company's Harrisburg, Pa., motor truck district sales operations succeeding M. H. Roth who has been transferred to Seattle, Wash., in a similar capacity. J. H. Baker has been named Manager of the Columbus, Ohio, motor truck district sales office.

OPERATION:

"PLANT RELOCATION"

by Roger Sherman with ROGER TRAILERS

It was a super-colossal "moving day" for Hamilton Standard Division, United Aircraft Corporation.

Roger Sherman of E. Hartford, Conn., tackled the job. 4000 machines were moved by a circuitous route to a new plant location 15 miles away.

Specialized rigging and hauling experience, plus the strong "back" of his new special-built Rogers 135-ton low-bed trailer, helped "turn the trick."

One huge plating machine 45 feet in length loomed up as a tough "nut to crack."

Original estimated moving time was 20 days. By handling it in one piece it was moved in 2½ days.

We are certain Rogers Trailers will meet your everyday requirements and handle those extra-tough jobs that often come your way.

We'll be glad to chat with you.

Little tots along the moving route are awed by the sight of the towering press and the huge trailer.

The 95-ton hot-form press is loaded on the big Rogers 135-ton DPG Power-Lift Detachable Gooseneck Trailer.

DISTRIBUTED IN FORTY-SEVEN STATES AND EIGHT CANADIAN PROVINCES

ROGERS HEAVY DUTY Gooseneck Trailers

EXPERIENCE builds them... PERFORMANCE sells them...

ROGERS BROTHERS CORPORATION
ALBION, PENNSYLVANIA, U. S. A.
Export Office
50 CHURCH ST., NEW YORK 7, N. Y., U. S. A. • CABLE ADDRESS: BROSITES

Extra Front Axle Increases Payload

An additional steering axle that is coupled to the standard front axle of a truck to increase payload capacity is offered by Chain Belt Co., 4701 W. Greenfield Ave., Milwaukee, Wis. The extra axle is connected by two walking beams and a few steering rods and is said to increase payloads as much as 10 and 15 thousand pounds for some 3-axle units. According to the manufacturer, each of the axles in the resulting front-tandem arrangement carries an equal share of the load—a legal requirement in most states.

The standard front axle remains in its original position so that the turning radius is not affected. While the gvw is increased by about 2,100 pounds by addition of the Rex-Spangler axle, the weight shift permits additional payload on the rear axle. A booster for steering under excessive load can be installed.

Among further advantages of the extra front axle is greater safety in case of a blowout. A second front axle also increases the tractive capacity of the truck for making turns. In off-the-highway work the greater number of wheels makes for more flotation.

For further information write to the company, or use the Request Card at page 18. Circle No. 280.

Air Pressure Spring Spreads Trailer Load

Automatically controlled air pressure in a new air spring for tandem trailers keeps the floor of the trailer parallel to the axles regardless of shifting loads, misloading, or high-crown roads. The General Air Spring works on the principal of an inflated rubber bellows. Adaptions of the spring for single-axle trailers, buses, tractors, and trucks are still in the testing stage.

With the spring the weight of the vehicle and load are said to be evenly distributed over 5½ feet of the frame, rather than concentrated at specific points. The trailer rides at the same height whether traveling empty or fully loaded. In case of damage to the air system of the spring, rubber shock pads within the springs take over, enabling the trailer to continue to the terminal for repairs.

For further information write to the General Tire & Rubber Co., Akron, Ohio, or use the Request Card at page 18. Circle No. 215.

Catalog on Motor Graders

A new catalog on the Warco 4-D series motor graders has been announced by W. A. Riddell Corp., Bucyrus, Ohio. The series includes Model 4D-85—an 85-hp unit—and the 4D-100, which is a 100-hp machine.

Action pictures show the grader at work. Text, photographs, and diagrams highlight features such as the full rotating saddle and the high front-end clearance. Another feature of the grader is that its blade, while entirely cab-controlled, reaches every working position without manual adjustment.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 322.

A Rex Spangler extra axle, added to this truck to increase its payload capacity, holds up over poor ground conditions.

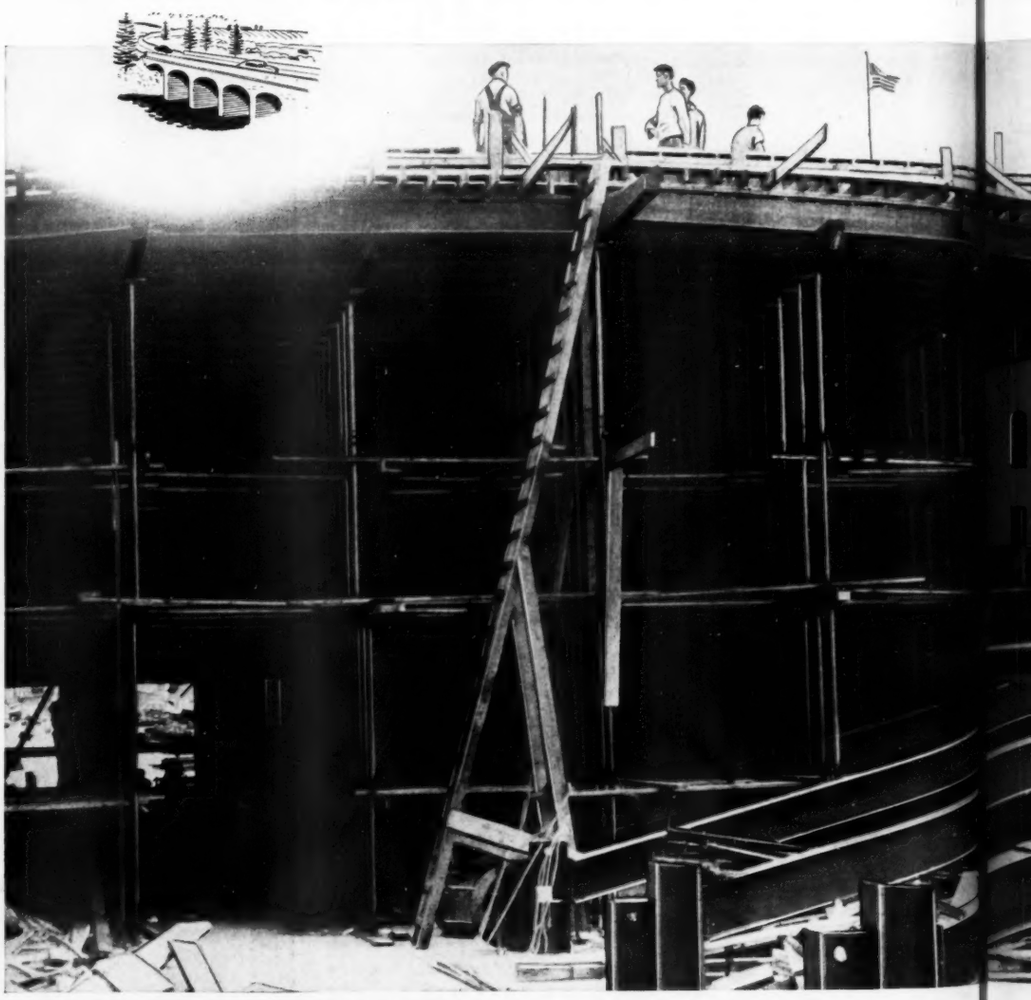
Clyde W. Wood Dies

Clyde W. Wood, founder of Clyde W. Wood & Sons, Inc., general contractors, and Wood Mfg. Co., manufacturer of roadbuilding equipment, both of North Hollywood, Calif., died suddenly on March 31, at the age of 62, in Pasadena, Calif.

In the general contracting business for more than 30 years, Mr. Wood constructed highways, canals, dams, bridges, tunnels, and airports throughout California and the west. Major projects in which Mr. Wood participated included those for the Los Angeles Metropolitan Water District, the State of California, U. S. War Department, Bureau of Reclamation, and the Corps of Engineers, U. S. Army.

Both the construction and manufacturing business will be carried on under the supervision of Mr. Wood's sons.

SAVES ⅓ ON BRIDGE



Acrow—The World's Largest Selling Shore

Over 1,000,000 Acrow Shores now in use without an accident

Acrows were set in place on a downward grade—double-decked to a total h ranging from 16 ft. to 26 ft. with a 3" x 8" plank between shores. Five t concrete were deposited on the deck supported by the Acrows at each dum

ACROW INC.

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Dallas, Riverside 6051
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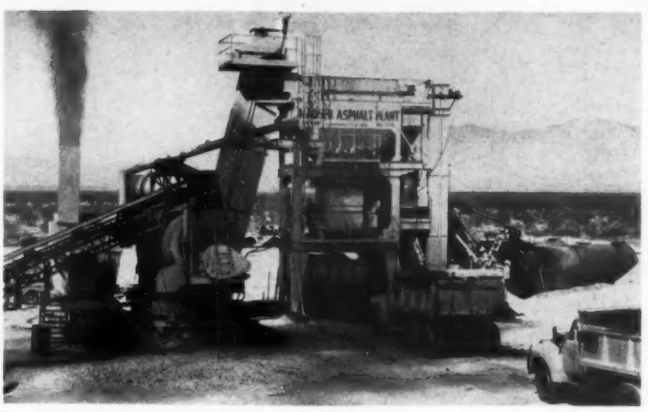
Los Angeles, Lomita 2889
San Francisco, ATwater 2-1442

Improved Asphalt Plant

A 4,000-pound-batch-capacity asphalt plant with a new method of withdrawing materials from its 4-compartment aggregate bin has been announced by Madsen Iron Works, Inc., P. O. Box 589, Huntington Park, Calif.

The materials from each compartment are withdrawn from three openings, one in the center and one at either edge of the bin bottom. When the single gate which covers the three outlets is opened, the material in the bin is drawn down from the two bin sides and the center. This is said to eliminate "coring out" and segregation, and to provide a more uniform withdrawal of material. The opening of each bin gate is accomplished by a single air-operated cylinder.

The mixer weigh box assembly in Model 481 incorporates features which the manufacturer claims will enable the owner to meet more exacting mix specifications, obtain faster production, and reduce servicing and maintenance costs. The operator platform is located at the end of the plant, away from dust, fumes, and heat. This gives the mixer man a better view of incoming and outgoing trucks and of the entire plant equipment, including scales and controls. The weighbox is roller-mounted so that it may be rolled away from the top of the mixer for easier mixing tip or shank replacement. The weighbox is carried on 4-point suspension-scale levers and has an air-cylinder-controlled discharge gate.



The Madsen 4,000-pound Model 481 is a batch-type asphalt plant which may be modified to handle 6,000 pounds to increase production facilities when needed.

For use with the new plant, the manufacturer has announced a new twin-shaft pugmill mixer, Model 440. It is available in 4,000-pound, 5,000-pound, and 6,000-pound capacities. The new mill has interchangeable liner sections approximately 9 inches wide, which are externally installed and externally removable. The plant is equipped with the company's pressure-injection system for pumping the asphalt into the pugmill in 5 to 7 seconds.

The plant uses a 42-inch x 12-foot or 48-inch x 12-foot Symons double-deck screen or a Symons 48-inch x 14-foot 2½-deck screen.

For portability, all units are within legal road widths. The company's dust-collector unit, dryer, and asphalt tanks are available for the new model.

For further information write to the company, or use the Request Card at page 18. Circle No. 335.

Building Industry Movie

A new motion picture, entitled "Good Housekeeping — For Men Only", is the third in a series of safety films produced by the Aetna Casualty & Surety Co., Hartford, Conn. The film deals with the construction industry, and forms part of the company's loss-prevention program.

The 13-minute film, produced in full color, shows how good housekeeping improves efficiency in the building industry. Among recommended practices in scenes from actual construction jobs, are: correct methods of storing bagged material, lumber, bricks, and explosives; arrangement of storage space to make supplies readily available; and use of cleanup crews to improve efficiency and reduce accidents.

The film can be obtained without charge from Aetna's Public Education Department at Hartford, or the company's local representatives throughout the country.

Line of Truck Mixers

A line of truck mixers available in six sizes ranging from 3 to 6½-yard-capacity is shown in a booklet from Cook Bros. Equipment Co., 3334 San Fernando Road, Los Angeles 65, Calif. The manufacturer lists factors that should be considered in deciding what truck-mixer size to use and discusses the models with these factors in mind.

The larger-size mixers are now available with side-mounted engines that make it possible to use standard trucks. The engine is also more accessible for maintenance and repairs.

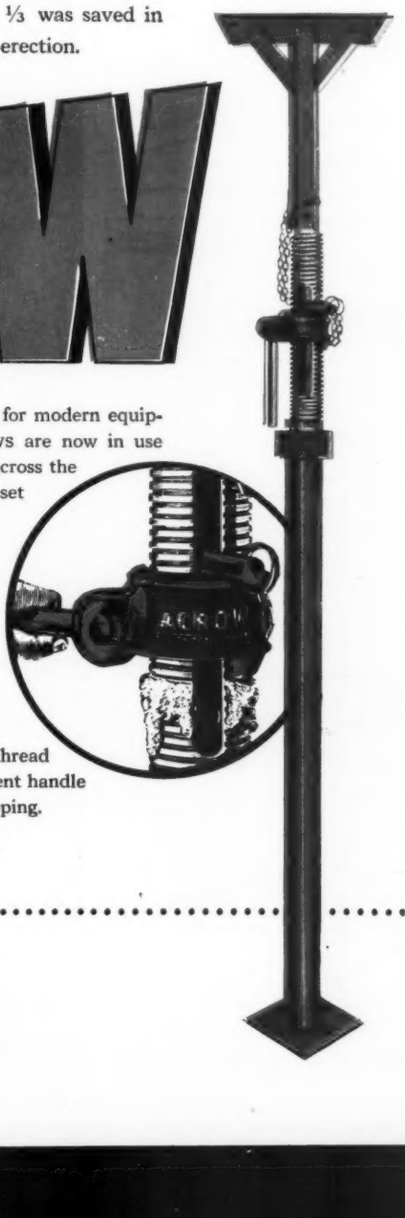
To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 334.

GFALSE WORK by using...

ACROW ADJUSTABLE STEEL SHORES...

DeMatteo Construction Company of Quincy, Mass., used Acrow Shores as underpinning on bridge false work when building the Sullivan Square Overpass, Boston. Over ⅓ was saved in lumber and labor costs during erection.

ACROW



Modern construction methods call for modern equipment. That's why all steel ACROWS are now in use on hundreds of construction jobs across the country. Safe, sure ACROWS can be set in seconds, stripped in seconds. They're adjustable, self-contained units easily handled by one man. And they can be used over and over on all types of jobs.

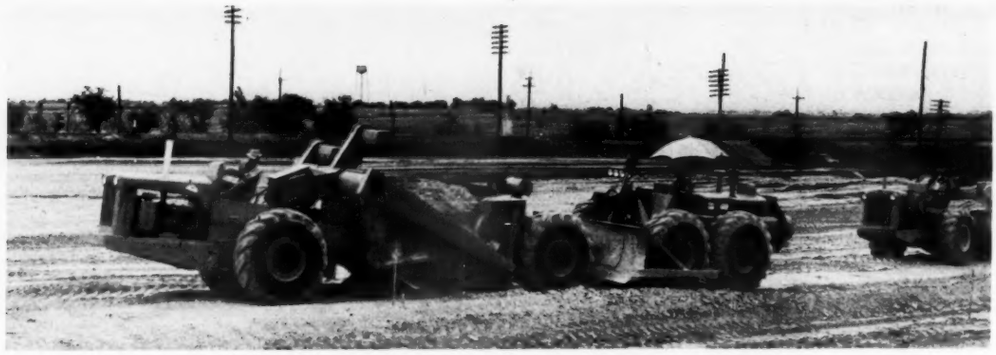
ONLY ACROWS ARE SELF-CLEANING—a patented stud on the collar nut automatically clears thread of concrete and dirt when adjustment handle is turned, assuring quick, easy stripping.

Write for complete information.

Dept. CE-6

ASSOCIATE COMPANIES

Acrow (Canada) Ltd., Montreal — Acrow Argentina S.A., Buenos Aires
Acrow Venezuela S.A., Caracas — Acrow Peru S.A. (Ingenieros), Lima
Acrow Brazil S.A., Rio de Janeiro — Acrow (Engrs.) Ltd., London
Acrow Uruguay S.A., Montevideo — Acrow Engrs. (Pty.) Ltd., Johannesburg
Acrow Engrs. (Pty.) Ltd., Sydney



A LeTourneau D Roadster, pushed by a LeTourneau Model C Tournadozer, picks up a load of dirt on the building site. *Ray Day Photos*

Dirt Flies on GM's New Texas Factory

650,000 Cubic Yards Moved in Less Than 90 Days, as Contractor Schedules Work Around Three Spreads

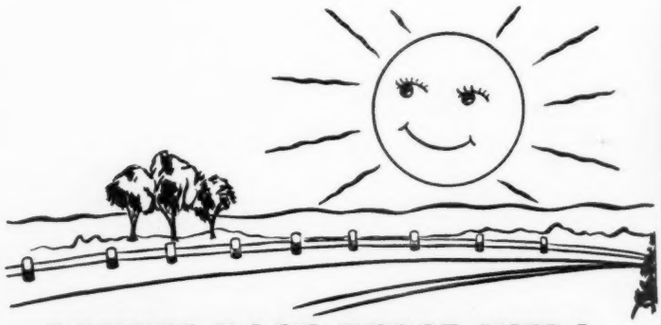
• MIDWAY between Dallas and Fort Worth, at a place called Arlington, Texas, one of the highest-speed pieces of dirt-moving seen in that area for a decade was finished last summer. With only 90 days time to move 650,000 cubic yards to make the foundation for General Motors' new $35,000,000 assembly plant, John S. Buckner & Sons of Cleburne, Texas, turned over the completed dirt job to Thos. S. Byrne, Inc., the general contractor, about 3 weeks ahead of schedule.

So delicately and precisely balanced were the three dirt schedules in the project that the three spreads finished up almost simultaneously. The only shifting of equipment was done within about 3 days of the completion of the earthwork. At one time the dirt outfit moved as high as 18,200 cubic yards in a 10-hour shift.

The new plant is situated on a 255-acre tract of good land directly across from the Arlington Downs Racetrack. It is being built for a twofold purpose. Approximately 40,000 square feet of space will be earmarked for the manufacture of Grumann-type navy warplanes used for submarine search and detection. The other 800,000 square feet of space will be devoted to the assembly of General Motors' well known automobile line: Buick, Oldsmobile, and Chevrolet.

Short Time Limit

A necessarily short time limit had



BOUNCE BACK THOSE INFRA-RED RAYS . . . Get Better Curing

Infra-red rays of the sun reflected back from freshly poured concrete by new White Permite PW-40 Concrete Curing Compound means no sharp temperature changes. PW-40 reduces expansion and contraction during the curing process . . . assures a more even distribution of the compound. ***A better job.***
Permite PW-40 has quickly sold itself to contractors and engineers all over the country . . . meets the specifications of Corps of Engineers, U. S. Army No. CRD-C-300-52. Write or send coupon below for complete data and name of nearest distributor.

Permite provides 100% resin and resin-wax concrete curing compounds, both clear and white pigmented, to meet all existing federal, state, county and city specifications.

A few good distributor territories still open

WHITE PERMITE

CONCRETE CURING COMPOUND PW-40

ALUMINUM INDUSTRIES, INC., 2438 Beekman St., Cincinnati 25, Ohio

PERMITE CONCRETE CURING COMPOUND

Send me test data and complete information on Permite WHITE Concrete Curing Compound PW-40 and name of nearest distributor.

Name.....

Address.....

City..... State.....

STANDARD STEEL PRESSURE DISTRIBUTOR

FULL CIRCULATING SPRAY BAR GIVES UNIFORM SPREAD OF MATERIAL THROUGHOUT LENGTH OF BAR . . .

SIMPLIFIED PIPING PERMITS FAST LOADING AND LAYING . . .

✓25% More Asphalt shot per day! Faster loading! No delays Starting! Instant cleaning at end of run! These are facts known to every operator of **Standard Steel Pressure Distributors!** Why? Because of the simplified piping in this equipment! The full circulating spray bar contains submerged valves which are quickly heated and remain uniformly hot at each point of pouring. The throw of a single lever opens and closes all valves instantly. Every inch of the spray bar delivers precisely the same material output—lightest or heaviest bituminous material. And there are 12 other special features that make this equipment outstanding in performance. Write for catalog 424 today for complete details.

OTHER PRODUCTS

Maintenance Distributors, Tar Kettles, Patch Rollers, Supply Tanks, Tool Heaters, Asphalt Tools, Street Flushers, Construction Brooms.

Built to the Highest Standard

PD3

Standard Steel Works, NORTH KANSAS CITY, MO.

to be set for the dirt work, because even 90 days would put the job on the September 1 mark. With major construction scheduled for the fall and early winter months, it was imperative that the excavation phase be finished rapidly, and in such a way that the compacted fills would be no source of trouble or maintenance later on.

And it was no easy dirt job. For example, over 320,000 cubic yards had to be moved an average one-way distance of 2,700 feet. Other hauls were much shorter. Much of the excavation lay in a hard white material, half clay and half caliche, which would not be too easy to dig. In some places cuts as deep as 9 feet were required, while in other spots 11-foot fills were necessary. The compaction specifications were stringent: 98 per cent densities on all fill material.

When John Buckner was selected to do the earthwork under a subcontract with the Byrne organization, he carefully analyzed the dirt plan so that the yardage would roll into place, and at the same time coordinate itself with foundation construction, footings, drilled caissons, trench excavation, and the installation of utilities, all of which would likely be started as soon as the earthwork was finished.

Buckner realized that the job was big enough to require help. He picked John A. Petty, a dirt specialist, to handle all excavation and fill on the east side of the building. Coy Beauchamp, another Fort Worth man, was selected to handle the west side spread. Buckner's crews took the main building area south and southwest of the other two spreads.

The newest and finest excavating machinery in that part of the country was selected. At the peak of operations there were 4 Caterpillar DW10's, 9 LeTourneau Model D Roadsters, 3 LeTourneau Super C Tournapulls, 6 Caterpillar 10-yard scrapers pulled by Allis-Chalmers HD-19's and 20's, a pair of Domor

(Concluded on next page)

A Barber-Greene trenching machine works on a ditch line in the plant area.

One of Watson Construction Co.'s special foundation drill rigs bucket-drills a square foundation hole 8 feet across.

ON YOUR BOOM MACHINE

SAUERMAN SCRAPER

When you add a Sauerman Crescent Scraper to your boom machine as auxiliary equipment, you are making a profitable investment which will repay many times its moderate initial cost. This unique bottomless bucket will in many cases, handle a Crescent of up to 50% greater capacity than its regular bucket or clamshell.

On short range work, such as backfilling, grading and similar jobs where material must be moved but does not require lifting, the Crescent is simply cast from the boom tip like the regular bucket. The Crescent bites into the earth wherever it strikes and fills to capacity on the forward pull. The load literally floats along the ground to the discharge point and is deposited when the scraper is raised by the boom line.

Above: A 1½-cu. yd. Sauerman Crescent used with a 1-cu. yd. dragline is lifted clear of the levee and returns to the borrow pit by gravity at 1500 fpm.

Above: Boom machine has a boom length of 110 feet and uses a 4-cu. yd. Crescent scraper, replacing a 2½-cu. yd. dragline bucket.

When a job calls for digging from a river, deep pit or soft area beyond the reach of the boom, the Crescent Scraper is suspended by chains from a simple trolley that rides on a track cable extending from the boom tip to an anchorage. One drum of the machine raises and lowers this track cable, while the other drum operates the inhaul cable attached to the front of the scraper. Digging, hauling and discharge proceed as in the casting operation. Following discharge the empty scraper is lifted and gravity-returned to the excavation point by merely tightening the track cable.

Find out how other operators use Crescent Scrapers on their boom machines for greater economy, efficiency and flexibility. Write today for illustrated literature.

SAUERMAN BROS., INC.
564 S. CLINTON ST., CHICAGO 7, ILL.

World-famous Contractors

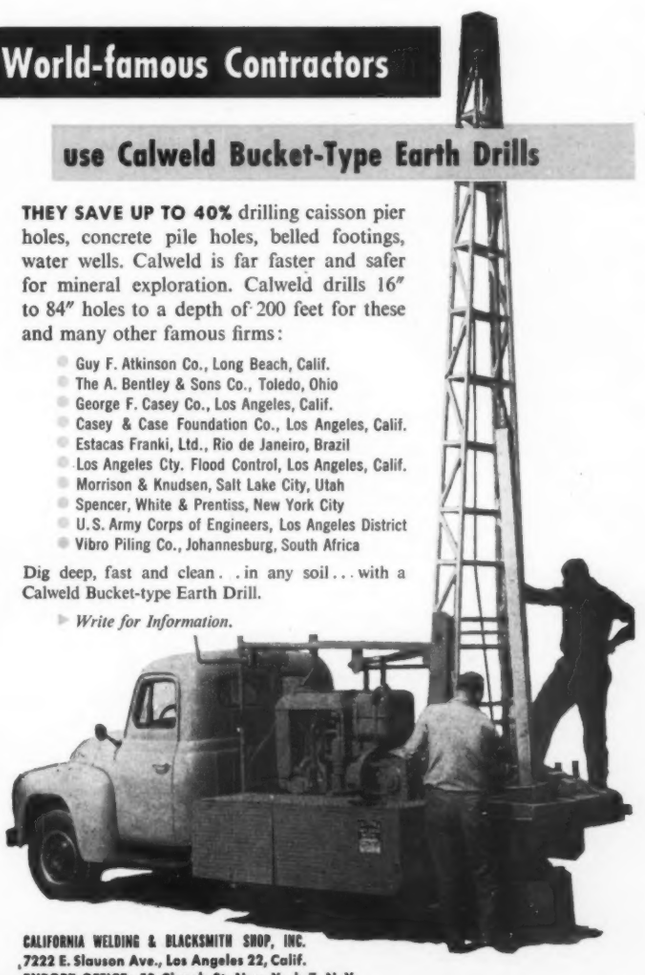
use Calweld Bucket-Type Earth Drills

THEY SAVE UP TO 40% drilling caisson pier holes, concrete pile holes, belled footings, water wells. Calweld is far faster and safer for mineral exploration. Calweld drills 16″ to 84″ holes to a depth of 200 feet for these and many other famous firms:

- Guy F. Atkinson Co., Long Beach, Calif.
- The A. Bentley & Sons Co., Toledo, Ohio
- George F. Casey Co., Los Angeles, Calif.
- Casey & Case Foundation Co., Los Angeles, Calif.
- Estacas Franki, Ltd., Rio de Janeiro, Brazil
- Los Angeles Cty. Flood Control, Los Angeles, Calif.
- Morrison & Knudsen, Salt Lake City, Utah
- Spencer, White & Prentiss, New York City
- U. S. Army Corps of Engineers, Los Angeles District
- Vibro Piling Co., Johannesburg, South Africa

Dig deep, fast and clean . . in any soil . . . with a Calweld Bucket-type Earth Drill.

▶ *Write for Information.*



CALIFORNIA WELDING & BLACKSMITH SHOP, INC.
7222 E. Slauson Ave., Los Angeles 22, Calif.
EXPORT OFFICE: 50 Church St. New York 7, N. Y.

CALWELD BUCKET TYPE EARTH DRILLS

Dirt Flies on GM's New Texas Factory

(Continued from preceding page)

elevating graders on Caterpillar No. 12 patrols, a pair of Lorain 1-yard draglines, 8 sets of LeTourneau and Tampo sheepsfoot rollers, 8 motor graders, 29 dump trucks of 5-yard capacity, and 8 water tank trucks of various sizes.

In Petty's spread were 5 D Roadsters, 3 of the Caterpillar scrapers, 3 sets of rollers, 3 water trucks, and 2 blades. In Beauchamp's section were 3 Tournapulls, 3 scrapers, the 2 Lorain draglines, 9 trucks, 2 sets of rollers, and a pair of water trucks. The remainder of equipment was in Buckner's spread.

Buckner had calculated as closely as he could the theoretical output of all types of equipment, to be sure enough machines were working to get the job finished on time. An approximate schedule was even made, so that if operators dropped below that figure, officials could check up to see what was wrong. The output of the Domor loader, for example, was set at 650 truckloads every 10 hours, and to give the operators incentive, a bonus system was set up beyond that. One ace operator, L. D. Booker, consistently beat the theoretical figure, and earned in addition to his regular salary and double time for the 2 hours overtime a nice bonus, 3 cents per load over 650. His best day accounted for 1,111 5-yard loads mucked out, and he was never below 750. Ten trucks were used under each of the Domor loaders, while a total of 9 trucks hauled from the 2 Lorain draglines.

On all tractor equipment work, push loading was used in the borrow pits. Several Model C Tournadozers performed excellently on that phase of work.

The excavated material was incorporated into fills by more or less conventional methods, except that the spreads were carefully controlled and rolling was thoroughly administered. Specifications allowed 8-inch lifts, but seldom was more than 6 inches placed at one time. The material was generally damp in place, so the light addition of water was sufficient to bring it up to its optimum compaction content. About 8 passes of heavy sheepsfoot rollers were made before the material developed its density.

When the dirt work was finished, foundation work began to move rapidly. After the first footings had been built, Watson-type drilled foundations were excavated. Project officials had the building started well above the ground line during the past winter.

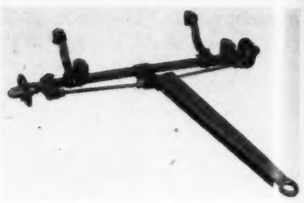
The excellent speed made by Buckner's equipment and men under Superintendent J. S. Blackburn—a veteran with 40 years in the dirt business—was the first source of satisfaction to the building officials when they were ready to start their work.

Emergency Helicopters To Help Battle Floods

The St. Louis District of the Corps of Engineers, U. S. Army, has established an emergency helicopter fleet that could be called into action during future Mississippi and Illinois River floods.

The stand-by fleet will provide District Engineer Col. Fred A. Ressegieu and his staff members with a first-hand look at critically flooded areas, where high water has often blocked automobile roads in the past. The fleet, to consist of four privately-owned helicopters which may be rented during flood emergencies between Cairo, Ill., and Saverton, Mo., would carry radio equipment to relay information to ground fighters. Helicopters could also evacuate flood victims.

During such emergencies, the planes would be based at Lambert Field, St. Louis; McBride Airport, McBride, Mo.; and other temporary landing strips along the river bottoms.



A new 1¾-inch square-beam front-automotive steering unit announced by the United Mfg. Co., 46 W. Interstate St., Bedford, Ohio, has a load capacity of 2,000 to 4,000 pounds. These units are recommended for transporting such equipment as electric generators, pumps, tar kettles, cable reels, and compressors. For further information write to the company, or use the Request Card at page 18. Circle No. 278.

WATSON-STILLMAN
HYDRAULIC POWER TOOLS FOR INDUSTRY

HYDRAULIC JACKS and HAND PUMPS

These sturdy jacks, with either independent or integral pumps, are useful for many jobs in construction and maintenance. Capacities to 500 tons. Pumps, single and double plunger types, with reservoirs of different capacities for operating small hydraulic tools, jacks and hydraulic equipment, and for general hydrostatic testing purposes. Jacks or pumps available separately.

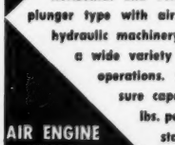
PORTABLE PIPE BENDERS

Bends standard, extra heavy and double extra heavy steel pipe from ⅜ inch to 2 inch, as well as standard weight pipe up to 3 inch diameter. Also solid mild steel bars up to 2 inch diameter.

9-0-10

WIRE ROPE SHEARS

W-S wire, cable and bar shears provide years of trouble-free general service. They are light and portable for convenient on-the-job use.



AIR ENGINE PUMPS

Horizontal and Vertical Operation. Single plunger type with air engine. Portable for hydraulic machinery, hydraulic tools and a wide variety of hydrostatic testing operations. Pump discharge pressure capacities 2,000 to 6,000 lbs. per sq. in. Operates from stationary or portable compressor. Requires single connection to air line.

Send for your copy of Bulletin A-S

WATSON-STILLMAN FITTINGS DIV.
H. K. PORTER COMPANY, INC.
Roselle, New Jersey

WELLMAN
easy handling of large stones

● Those big stones won't slip from the Wellman Stone Grab. Four-part closing cable reeving develops tremendous closing force on stones. Model shown has 5-ton capacity, 4½ foot jaw spread. Other capacities available.

Want Facts?
Send for free descriptive bulletins.

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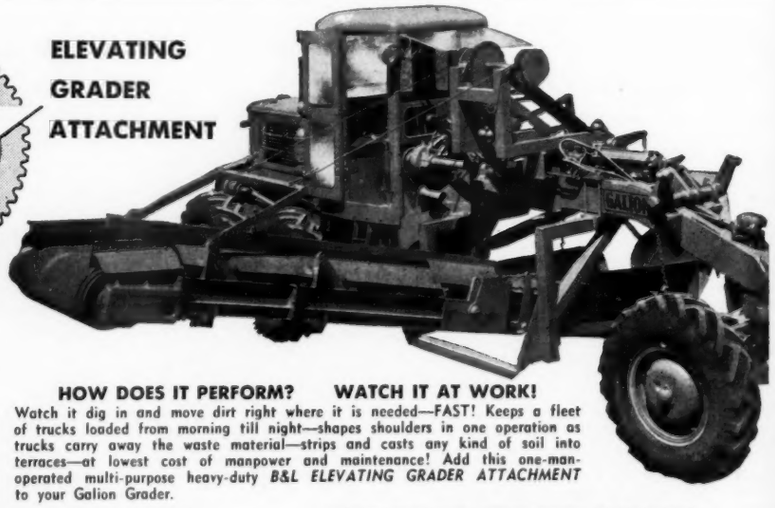
B&L

ELEVATING GRADER ATTACHMENT



GET FULL VALUE FROM YOUR GALION

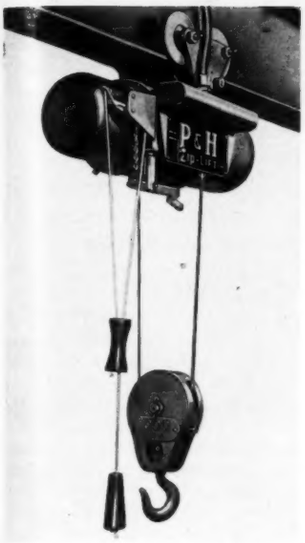
HOW DOES IT PERFORM? WATCH IT AT WORK!
Watch it dig in and move dirt right where it is needed—FAST! Keeps a fleet of trucks loaded from morning till night—shapes shoulders in one operation as trucks carry away the waste material—strips and casts any kind of soil into terraces—at lowest cost of manpower and maintenance! Add this one-man-operated multi-purpose heavy-duty *B&L ELEVATING GRADER ATTACHMENT* to your Galion Grader.

CASTING

LOADING

WRITE FOR FREE DESCRIPTIVE LITERATURE

CONSTRUCTION MACHINERY DIVISION
BARNARD & LEAS MFG. CO., INC.
CEDAR RAPIDS, IOWA



Electric Hoist Offered In Rope-Control Model

A new version of the P&H Zip-Lift electric hoist operates by rope control. It is offered in two models with lifting capacities of 500 and 1,000 pounds. Hoisting rates are 25 and 13 fpm. Both models are available with 12-foot and 18-foot lift.

According to the manufacturer, the new hoist will operate 25 per cent longer than the rated time limit for intermittent use. The weight-overload safety factor is said to be five times the rated capacity.

Wire-rope hoisting is used because of its wider range of side pull and greater safety from hidden wear. Other features are double brakes, oil-bath lubrication, fully enclosed construction, and greased-packed motor bearings.

For further information write to the Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis., or use the Request Card at page 18. Circle No. 275.

White Cement Sealer

A formula for sealing and finishing white portland cement, white marble, and white terrazzo floors is made by Hillyard Chemical Co., 290 Robidoux St., St. Joseph, Mo.

According to the manufacturer, it permeates the pores of the floor surface to become an integral part of it. It is said to prevent surface checking, efflorescence, and to protect against penetration of moisture and stains.

White Onex-Seal applies with lambswool applicator, without streaking. After drying, it buffs or burnishes to a lustre and is said to give a slip-resistant finish that needs no waxing. It can be maintained dry with only occasional mopping.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 265.

Booklet on Welding Line

A new brochure on welding accessories is issued by the Welding Products Division, A. O. Smith Corp., P. O. Box 584, Milwaukee 1, Wis. It gives full specifications and descriptions of the company's welding accessories.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 209.

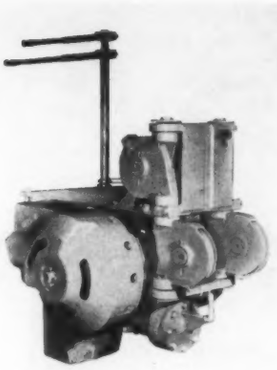
Cable-Control Unit

A cable-control unit for tractors of 130 hp or more has been introduced by the Wooldridge Mfg. Co., Sunnyvale, Calif. The Model WD-2 has a power train made up of one worm gear and wheel.

The unit has double drums of 10-inch barrel diameter. Line speed at 1,000 rpm input is rated at 343 fpm with bare drum and 542 fpm with full drum. Each drum has a cable capacity of ½ inch by 235 feet or 9/16 inch by 186 feet.

The unit is made for use with Caterpillar D8, Allis-Chalmers HD-20 and HD-19, and International Harvester TD-24 tractors, and may also be adapted to certain other large units. The new Model WD-2 covers the range above that of the Model WE-2 which is used on tractors under 130 hp.

For further information write to



the company, or use the Request Card at page 18. Circle No. 173.

Concrete-Form Supports

Supports for concrete forms are featured in a new booklet from the Webrib Steel Corp., 120 Broadway, New York 5, N. Y. Sections of Hico girders are assembled to span lengths of 3 to 27 feet. The spans weigh 8⅓ pounds per foot.

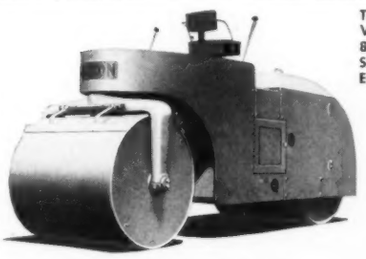
Sections are available in various lengths and end pieces are ajustable. The booklet shows the supports on several kinds of concrete work.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 336.

McDaniel Is Promoted

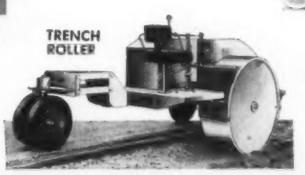
The H. K. Ferguson Co., Cleveland, Ohio, industrial engineer and builder, has appointed Wayne S. McDaniel as Chief Engineer, Eastern District, with headquarters in New York, N. Y. The district includes the Atlantic Seaboard states and New England.

Mr. McDaniel has served with the company for 13 years.



TANDEM ROLLERS
Variable Weight: 5-8, 8-12, and 10-14 Ton Sizes. Gasoline or Diesel Engine.

THREE-WHEEL ROLLERS
6, 7, 8, 10 and 12-Ton Sizes. With Cast or Variable Weight Ballastable Steel Rolls. Gasoline or Diesel Engine.



TRENCH ROLLER

SMALL TANDEM ROLLER
Variable Weight, 3-5 Ton. Gasoline Engine.

PORTABLE ROLLER
Variable Weight, 7100-9765 lbs. Gasoline Engine.

GALION HAS THE ANSWER!

BUILT-IN VALUES

GALION has had forty-six years of experience building-in the values that mean the most to you —

JOB PERFORMANCE
VERSATILITY
DEPENDABILITY
ECONOMY
SIMPLE OPERATION
EASY MAINTENANCE
LONG LIFE

Write for literature on the type and size of equipment in which you are interested.

THE GALION IRON WORKS & MFG. CO.
General and Export Offices
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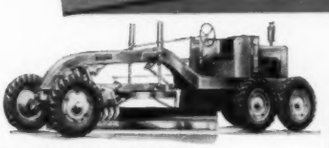
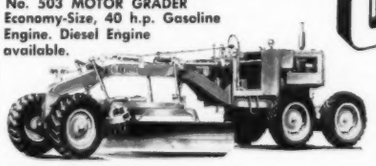
Cable address: GALIONIRON, Galion, Ohio

FOR YOUR ROLLER AND GRADER NEEDS

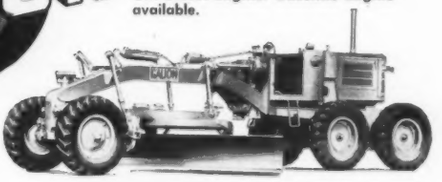
ESTABLISHED GALION 1907



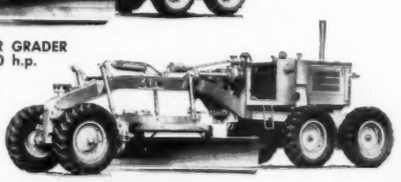
No. 503 MOTOR GRADER
Economy-Size, 40 h.p. Gasoline Engine. Diesel Engine available.



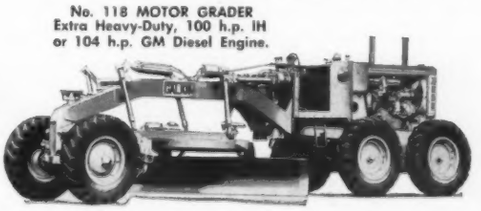
No. 104 MOTOR GRADER
Heavy-Duty, 76 h. p. IH or 85 h. p. GM Diesel Engine. Gasoline Engine available.



No. 303 MOTOR GRADER
Medium-Duty, 50 h.p. Diesel Engine. Gasoline Engine available.



No. 118 MOTOR GRADER
Extra Heavy-Duty, 100 h.p. IH or 104 h.p. GM Diesel Engine.



No. 203 MOTOR GRADER
Medium Heavy-Duty, 70 h. p. Diesel Engine. Gasoline Engine available.

Utility Buildings

Literature on small sectional portable utility buildings is available from the Wright Co., 9317 Cottage Grove Ave., Chicago 19, Ill. The buildings come complete with floor, roof, double or single doors, windows, ventilators, skids, and they have one coat of paint. Doors and windows are placed wherever desired.

Sections are bolted and made of tongued-and-grooved fir. Three-ply asphalt slate-coated roofing is offered. Side sections come 7 to 10 feet long and 7 feet high.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 337.

Power Plants Speed Construction
USE POWER TOOLS—FLOOD LIGHTS

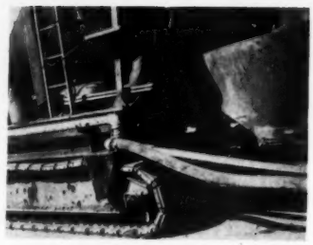
WINPOWER PORTABLE ELECTRIC PLANTS provide a dependable, low cost power source . . . speed up work performance by operating time and labor saving power tools.

WINPOWER NITE-HAWK units give power plus flexible floodlights. Every contractor should use these high efficiency, quality built plants.

WRITE FOR LITERATURE AND PRICES

WINPOWER MFG. CO.
TEL. 236 NEWTON, IOWA

500 to 12,000 watts A.C. or D.C.



Rubber-Lined Crawler For Concrete Pavers

Pavers can move over finished concrete without damaging the surface when equipped with rubber-padded crawlers. Resilient rubber is vulcanized to steel plates and bolted to crawler pads in a new process developed by Metalweld, Inc., Scotts Lane & Abbotsford Ave., Philadelphia 29, Pa. The rubber pads eliminate the labor and time cost necessary to continually re-lay belting.

The process used is B. F. Goodrich Vulcalock Bonding which joins rubber and steel together with a bond strength of over 500 psi.

For further information write to the company, or use the Request Card at page 18. Circle No. 279.

GULF PRODUCTS *and* **FINE SERVICE**

keep equipment rolling

on Florida Air Base Project

Hooper Construction Company, Coral Gables, Fla., has the subcontract for excavation in connection with the U. S. Engineers Project at Pine Castle Air Force Base, Orlando, Fla. The job involves moving about 1,000,000 cubic yards of earth. The prime contractor on the project is the W. L. Cobb Construction Company of Decatur, Ga., and Tampa, Fla.

THIS is another large and important project where the contractors rely on Gulf to help keep equipment delivering top performance.

Contractors like Hooper Construction Company, for example, know from experience that Gulf quality lubricants provide an extra margin of protection against mechanical delays. And that Gulf quality fuels insure full engine power and efficiency.

Then too, they appreciate Gulf's prompt delivery service—and the engineering counsel that Gulf provides to make sure that the most suitable petroleum products are used for every unit.

Let us discuss with you how Gulf products and service can help you on your next job. They are quickly available to you through more than 1400 warehouses in 31 states from Maine to New Mexico.

GULF

Timber Literature, Kits, For Engineering Courses

Correspondence courses, night schools, and extension services are more than ever supplementing regular college and university courses in engineered timber construction. Expansion of these courses reflects trends toward more timber construction and the demands from students, architects, and engineers for more specialized training in modern timber design.

For 15 years Timber Engineering Co., has been supplying free copies of educational booklets to architectural and engineering professors requesting them. These booklets serve as supplements to textbooks for courses in architecture; structural, civil, chemical, and agricultural engineering; timber physics; mine structure; oil and gas engineering; bridge and other structural design.

A comprehensive outline course in timber engineering has been developed and made available by TECO, without charge.

The organization has augmented its technical literature with display kits containing four full-scale timber joints. They illustrate the wedge-fit split-ring connector in its conforming groove, a shear plate in position, and Trip-L-Grip framing anchors connecting joist to header, and rafter to plate. Kits are offered without charge to department heads or instructors in architectural and engineering colleges only.

Information about the educational material available for professional institutions by the lumber industry's research organization may be obtained from Timber Engineering Co., 1319 18th St. N. W., Washington 6, D. C.

Stack-Gas Scrubber

A new precipitating-type scrubber for removing dust from stack gas is described in a folder from Johnson-March, 1724 Chestnut St., Philadelphia 3, Pa. The LP scrubber is adaptable to the control of dust from asphalt plants, exhausts from rotary dryers, and cyclone exhausts. It can handle high-temperature gases in capacities ranging from 1,500 cfm to 48,000 cfm.

The folder includes a cutaway view of the scrubber and a sketch showing multiple scrubbing-action principles. A specification table and technical data are also given.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 338.

Lyall Elected President

J. B. Lyall, formerly Vice President of Vermiculite-Northwest, Inc., Spokane, Wash., was elected President of Vermiculite Institute, Chicago 4, Ill., at an annual meeting attended by representatives of member companies throughout this country, Canada, Hawaii, and Japan.

New wet-cutting abrasive blades are said to cut a 2 x 5-inch Natco furring tile in only 11 seconds, face brick in 8 seconds, and concrete block in 17 seconds. For further information write to Clipper Mfg. Co., Suite 635, 2800 Warwick, Kansas City 8, Mo., or use the Request Card at page 18. Circle No. 298.

Washo Road Test Statement Issued

A statement was isued by the Highway Research Board describing the nature and extent of damage caused to the Western Association of State Highway Officials test road by the 17,000 heavy-axle applications last fall. (See C. & E., May, 1953, pg. 43.)

In designing the test pavement, the engineers selected a range of thicknesses which they considered would exemplify average design, over-design, and under-design, bearing in mind the contemplated test traffic and the construction materials used. They thought it likely that the thinner sections would fail before the end of the test.

Satisfactory research interpretation of the load-carrying capacity of pavement is more effectively obtained if the variations in axle load and pavement thickness extend over a wide range.

Five different pavement thicknesses, ranging from 6 to 22 inches, are in each of the two loops of the test road. The 1952 test traffic caused appreciable cracking and displacement of the surface in the two 6-inch-thick test sections, constructed with only 4 inches of granular base and 2 inches of asphaltic-concrete surfacing over the subgrade. Surface cracking was also noted in very small areas in some of the thicker sections under the heaviest tandem axle loads. In all of the thicker sections maintenance, consisting of the use of thin bituminous skin patches over the cracked areas, retarded development of cracking so that test traffic could be continued. On some of the thinnest sections under the heaviest loads the pavement had to be removed and replaced by a thick granular base and new asphalt surface in order to maintain test traffic. No distress was noted in 18 of the 23 test sections.

Research on the project, located between Ogden, Utah, and Pocatello, Idaho, is administered and operated by the Highway Research Board of the National Academy of Sciences, Washington, D. C.

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Nickel-Iron Electrode

An electrode for cast-iron welding is the subject of a booklet from the International Nickel Co., Inc., 67 Wall St., New York 5, N. Y. Deposit of the electrode, Ni-Rod 55, is approximately 0.40 iron and the balance nickel. Carbon is added to the deposit through the flux coating to get graphitic carbon in the fusion.

According to the manufacturer, the electrode is particularly suitable for repairing working surfaces, such as dies, gear teeth, and cams. The weld metal is said to fuse thoroughly with the parent cast iron and will not spall out.

The booklet shows the kinds of cast-iron welding that this electrode can do.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 252.

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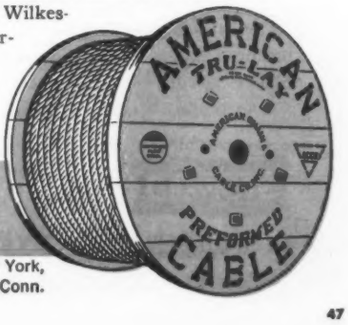

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Steel Dam Serv

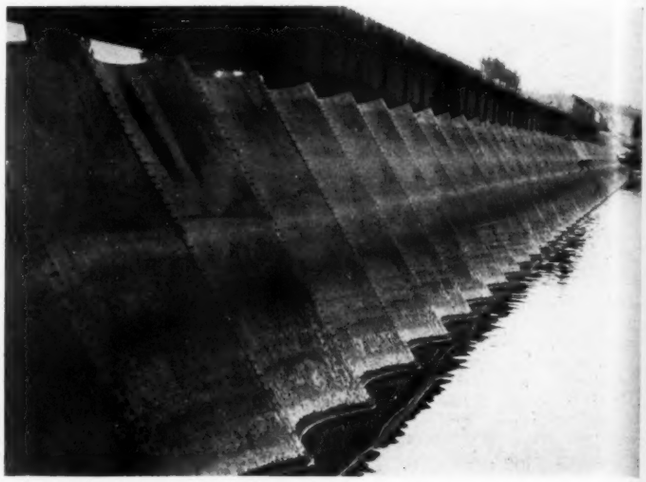
By GEORGE W. LAMB, District Engineer
American Institute of Steel Construction, Topeka, Kans.

• IN 1900 a fixed steel dam was constructed across the Salmon Trout River, a stream in the Upper Peninsula of Michigan, near Redridge, Houghton County. It was the second steel dam of this type to be constructed in the United States, built as a storage structure to provide a water supply for the milling operation of the Atlantic and Baltic mines of the Copper Range Co., Boston, Mass. D. E. Moulds, General Manager, reported in October, 1952: "The dam has received little or no maintenance as the Atlantic mine closed down in 1906, the Trimountain mill in 1915, and the Baltic mill in 1922. Closing of the mills terminated the need for water storage but the dam was allowed to remain. Pitting at the water level is a maximum of 1/4 inch or reduction in strength of about 4 per cent. Except for minor repairs the dam is in good condition."

While the dam itself was in excellent condition, the bypassing wood flume spillway had partially failed at its downstream end due to the spring flood conditions, and particularly the flood of 1941 when the water went over the crest at a depth of about 8 inches. This failure was progressing upstream, eventually would have been a hazard to the highway, and in time would have drained the reservoir. An examination of the structure disclosed that the proper repairs would entail considerable expense. As the water storage provided by the dam was no longer needed, it was proposed to remove the dam and to protect the highway by a system of permanent drainage. Subsequently the reservoir was drained, and the dam will be removed.

Design and Construction

The design of the dam was proposed by J. F. Jackson, Resident Engineer of the Wisconsin Bridge and Iron Co., Milwaukee, Wis. It was designed and constructed under the direction of Foster Crowell, Consulting Engineer. F. C. Groggins, Jr., Superintendent of the stamp mills, was in general charge of the entire works. Judgment in the selection of this type of dam was excellent as was vindicated by the performance of the structure during the past 52 years.



Looking northeast at the upstream side of the dam.

The reservoir had an area of 150 acres and storage capacity of 1,700 acre feet. The dam was not designed as an overflow dam, and the spillway to accommodate the excess water was constructed several hundred feet west of the dam. The dam had a maximum height of 74 feet and was 1,006 feet long, 464 feet of which was of steel construction. The remainder was the fill of the railroad constructed just below the dam's axis. This fill, with a concrete core wall, was generally above the normal level of the reservoir and was in good condition. The steel part of the dam had always been tight and free from leaks, although there were a few small leaks of no consequence through the coarse concrete of the base. The concrete abutments at the ends of the steel structure, near the normal level of the reservoir, were spalled somewhat, due perhaps to the action of moisture and frost at points of stratification in the concrete.

The steel part of this dam was framed with 57 triangular bents, spaced at 8-foot centers and braced laterally in sets of three. The 3/8-inch face plates were curved concave toward the water and were sup-

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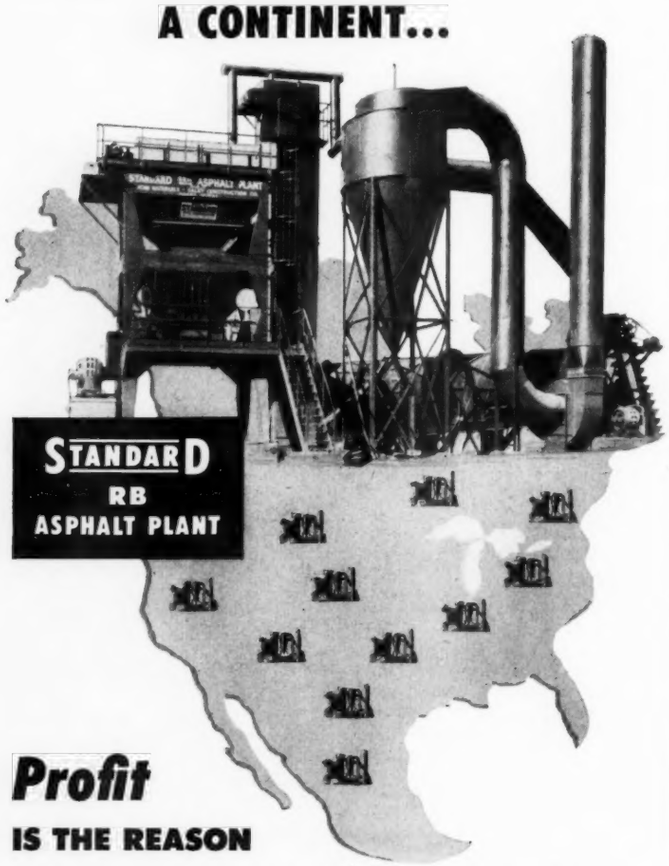

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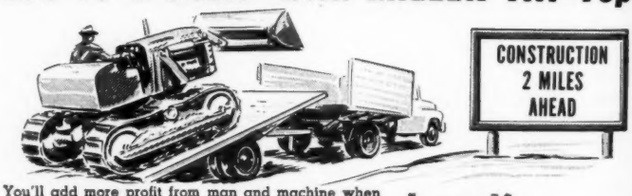

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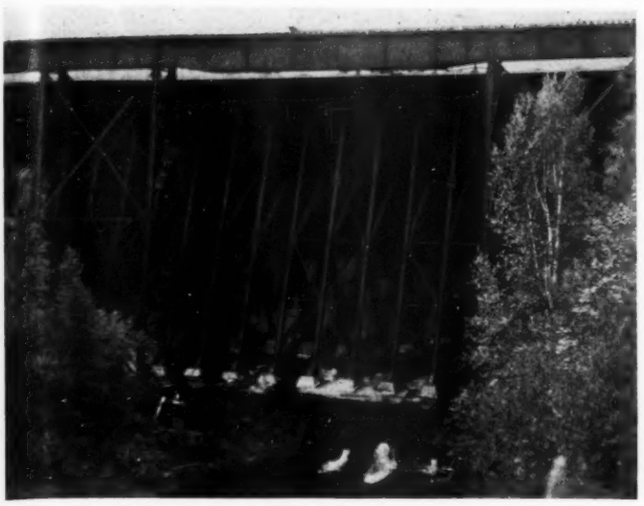

Looking south at the downstream side of the dam.

ported on sloping I-beam face girders of the bents. These plates were thicker than required for strength and apparently this thickness was selected to compensate for corrosion, which was not as serious as expected. Other parts of the steel structure were designed to meet stress requirements and some members were ¼-inch thick. As the structure was riveted, all edges of plates exposed to the water were bevel-planed and calked watertight.

The concrete base was founded on bedrock which is hard, strong, and generally free from fissures. This base varied in thickness and width depending on the height of the dam, furnishing sufficient weight when combined with the resultant water pressure, so that with the water at the crest of the dam, the resultant pressure fell within the middle third of the base. The coefficient of friction against sliding was assumed to be 0.69.

Since the Salmon Trout River flows throughout the year, the dam had been full of water for almost its entire 52 years. The location of the dam was about 2,000 feet from the mouth of the river where it empties into the south shore of Lake Superior. The weather in that vicinity has a temperature range from 108 degrees above zero to 27 degrees below, with an annual average of 41.4 degrees. The temperature goes above 90 degrees on an average of four times a year and below zero 13 times a year. The average annual precipitation, occurring on 159 days a year, is 32 inches, which includes an average snowfall of 109 inches. There are 73 clear days a year. The dew-point temperature is frequently above the temperature of the stored water, and thus caused condensation on the downstream side of the face plates. This condition had no visible effect on the steel or paint, but did cause a constant damp and wet condition to exist on the concrete base of the dam. The water stored was unusually pure and practically neutral as is all the water originating in the lava flow of that country.

Steel Used

Steel used in the dam was a soft steel very similar to American Society for Testing Materials A-7. The weights of the steel in the dam as reported by Wisconsin Bridge and Iron Co., the fabricators, were as follows:

Steel for Redridge Dam proper	901,811 lbs.
Steel for 472 feet of railroad trestle	266,102 lbs.

The cost of the steel erected in the dam was less than $100 per ton and for the railroad trestle just over $100 per ton, indicating that the steel in the dam was somewhat less difficult and expensive to fabricate and erect than the steel in the railroad trestle. The prevailing price of unfabricated structural steel in 1900 was about $20 per ton and would, of course, be much more expensive at the present time.

The curved steel face plates were originally painted under the following specification: "After erection the ⅜-inch face plates shall be painted one coat of Edward Smith & Co.'s durable metal coating." There is no data on the remaining parts of the structure. When the dam was painted the last time in 1913, the paint used was reported to have been a mixture of white lead, linseed oil, and a black pigment. The paint was in good condition except for the

(Concluded on next page)

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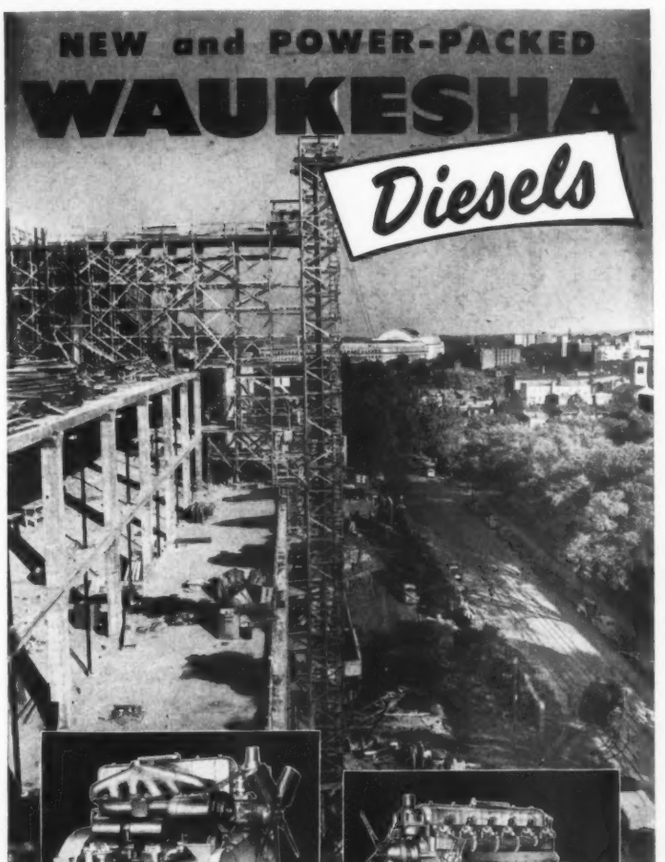

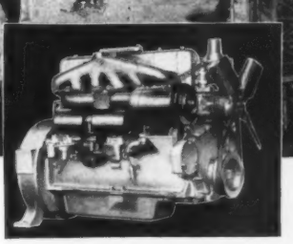

The 195-DLC Medium Speed Diesel, manifold side, showing intake and up-exhaust manifolding; waste-packed lubricating oil filters; 12-volt pivot-mounted belt-driven generator; fuel supply pump; water pump by-pass, and foot-type flywheel housing.

195-DLCA High Speed Diesel, injection side, with pump mounted governor and fuel supply pump, fuel filter, water pump, single orifice pintle-type nozzles, drawn steel injection tubing of uniform length, 12-volt starting motor, vibration dampner, arm-type flywheel housing.

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A high-output high-speed Diesel, with counterbalanced crankshaft, 195-DLCA has a 98 hp max. @ 2800 rpm. The medium speed, with standard crankshaft, 195-DLC has a 96 hp max. @ 2400 rpm for momentary overload, 86 hp @ 2400 intermittent and 67 hp @ 2000 for continuous duty. Both models have aluminum pistons, six cylinders, 4-in. x 4-in., 302 cu. in. displ.

208

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
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Steel Dam Serves

(Continued from preceding page)

water side of the face plates, the bearings of the railroad girders, and a few other places where anchors or columns were encased in isolated pieces of concrete.

Although this steel had not been painted or maintained for 39 years, it was in excellent condition, and corrosion, except for the water side of the face plates, was almost nonexistent. The corrosion that had taken place at the five tie rods mentioned previously, was at the intersection of the steel and an isolated piece of concrete, and was a rather common occurrence in structures where this condition of intersection exists. Many specifications today require that closed pockets in steel construction, where water could collect, shall be filled with concrete; however, quite frequently when this is done the corrosion is worse than in the places where it is not done. In this dam some of the tie rods and column bases corroded where they entered isolated pieces of concrete. Where the tie rods and columns entered the main mass of the concrete, corrosion had not taken place. The corrosion on the water side of the face plates showed as pits with a maximum depth of 1/64 inch, which were closely spaced, uniform, and not of a serious nature. The water side of the plates faced the south and the sun, and the paint was almost all gone, even above the normal reservoir water level. Information regarding the painting of the water face of this dam in 1913 could not be found.

As dams require constant maintenance to prevent failure, the Redridge Dam was unusual because it had little or no maintenance since 1913 and was still in good condition. After rigidly inspecting this structure, it could be said that with very minor repairs to the steel and some repair to the concrete, it would be safe for another 52 years, even without painting. The original design was well chosen and well executed, and the resulting safety, low cost, and lack of maintenance cost were apparent in the structure. A considerable part of the original cost of the steel will be recovered as salvage.

Information relative to the dam was obtained from an inspection of it in September, 1952, supplemented by information from D. E. Moulds, General Manager of the Copper Range Co., and information from records of the dam up to 1935.

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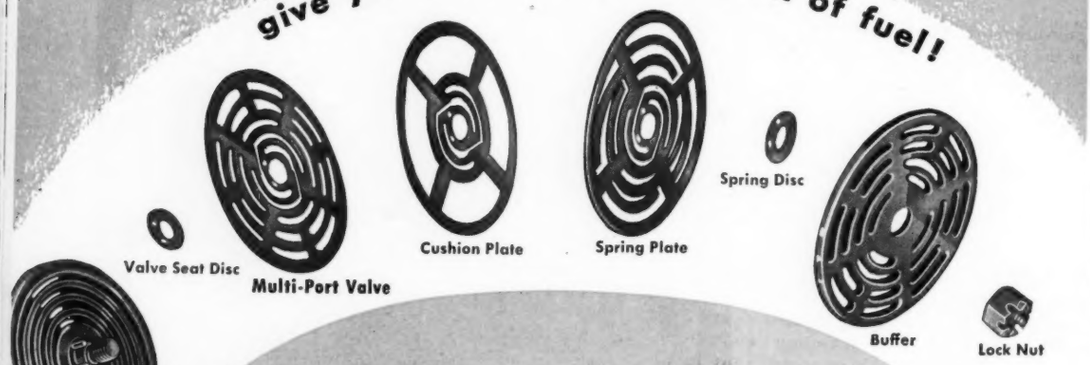

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Industrial Atomic Association Formed

Businessmen, engineers, scientists, and educators have joined to form an organization to further the industrial development and application of atomic energy for peaceful uses. Atomic Industrial Forum, Inc., with headquarters in the Engineering Societies Bldg., 29 W. 39th St., New York, N. Y., will be under the direction of presidents or key atomic energy executives of 13 corporations and institutions of higher learning.

The aims of the Forum are: to encourage and foster the development and utilization of atomic energy in accordance with American democracy and free competitive enterprise; to provide a forum in which individuals and organizations may consult and cooperate in the resolution of problems relating to atomic energy and of concern to the nation, industry, or the general public; to promote the dissemination, to an extent consistent with national security, of knowledge and understanding of atomic energy's development and utilization; and to foster and encourage research and development relating to atomic energy.

The association was formed as a result of a proposal by Dr. T. Keith Glennan, President, Case Institute of Technology, after his resignation as a member of the Atomic Energy Commission. A broad membership of all businessmen, engineers, scientists, educators, and others involved or interested in atomic energy as a new and promising industry will be sought by the Forum.

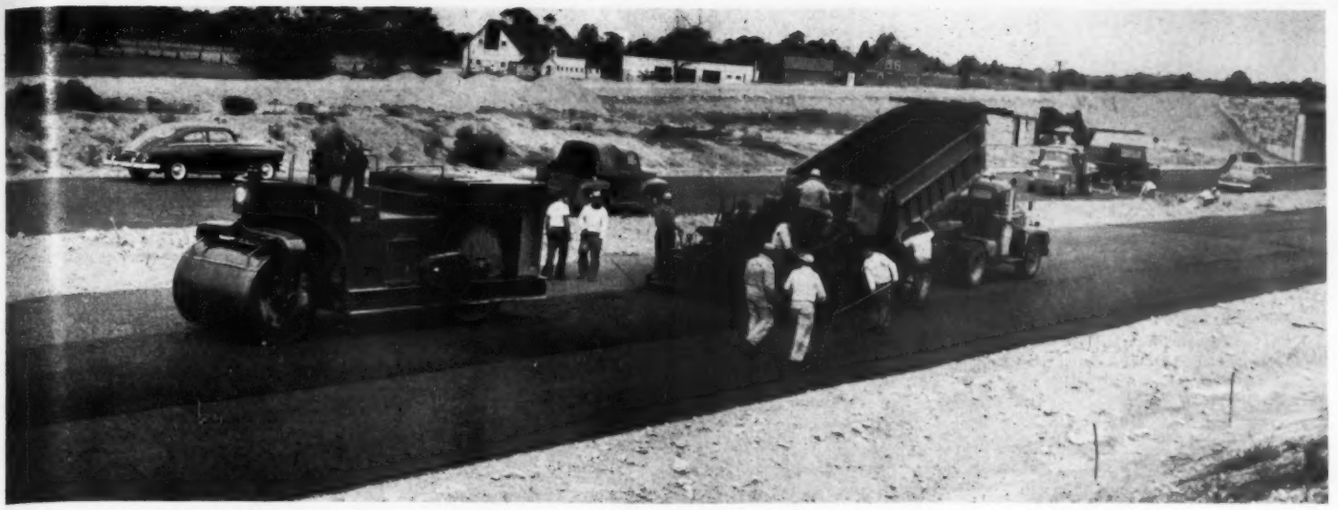
Membership will fall into two classes. Regular membership will be open to individuals who are lawfully entitled to access to any "restricted data" as defined in the Atomic Energy Act of 1946. Special membership will be open to individuals, corporations, associations, partnerships, and trusts, which are now or expect to be engaged in research, development, or operations concerned with atomic energy. Only regular members will have voting privileges and be eligible to serve on the Forum's Board of Directors.

Gronlund Represents Pettibone Mulliken

John Gronlund has joined Pettibone Mulliken Corp. as District Representative with the company's New York City Office in the Empire State Bldg.

Pettibone Mulliken Corp., 4700 W Division St., Chicago, Ill., manufactures equipment for crushing, screening, conveying, loading, earth handling, and motor grading.

Mr. Gronlund has spent many years in specialized bridge and highway construction, and drainage and reclamation work.



Bituminous concrete is laid with a Barber-Greene finisher and compacted by a 12-ton Buffalo-Springfield roller. The mix was hauled 16 miles in the 20-ton Fruehauf.

Flexible Pavement For Divided Highway

First Section of Boston-Fall River Expressway Provides 34-Foot-Wide Blacktop in Each Direction

• ONE of the longest sections of 4-lane divided highway opened to traffic last year in Massachusetts was the 14-mile stretch of the Boston-Fall River Expressway between Fall River and Route 44 in Raynham.

The new superhighway will eventually be extended north to provide a fast limited-access route from the Newport-Fall River-New Bedford area to Boston. The expressway will be tied in with a central traffic artery now under construction in downtown Boston, and will also be linked with a proposed east-west toll highway.

Work on the 14-mile section began in the summer of 1951. The $2,515,000 contract covering the 8.4-mile stretch south of Raynham was awarded to J. F. Fitzgerald Construction Co. of Boston. This work was completed during the summer of 1952, but the road was not opened until the entire 14-mile length was completed near the close of last year.

The $3,110,000 contract for the 5.5-mile section north of Fall River was awarded in the fall of 1951 to M. DeMatteo Construction Co. of Quincy, Mass. Eight bridges, including one large river span, were included in the contract. Work began late in 1951, and was sufficiently complete by late 1952 to permit opening to traffic.

Design

The Boston-Fall River Expressway is one of the most modern highways built by the Massachusetts Department of Public Works. It has controlled access throughout the entire length, and has two 34-foot-wide lanes separated by a 20-foot-wide median.

Pavement is 2½-inch bituminous concrete on 4½ inches of penetration macadam base. The surface slopes ¼ inch per foot from the crown, which is 12 feet in from the inside edge. Twelve-inch compacted gravel subbase supports the pavement. It is lipped around the inside edge of the pavement and carried to the surface. In fills, it is extended out to the edge of the embankment.

The 20-foot-wide depressed median strip slopes 6 to 1 on both sides toward the center. It consists of 4 inches of topsoil on 6 inches of non-leaching material. Embankments slope 4 to 1.

Southern Section

The Fall River-Freetown job called for the removal of 1,000,000 cubic yards of earth and 75,000 cubic yards of rock. DeMatteo Con-

(Continued on next page)

CONCRETE CARTS
EASY to WHEEL—EASY to DUMP

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No. 626-PR Sterling Cart with dumping rockers and 4.00 x 18 pneumatic tires.

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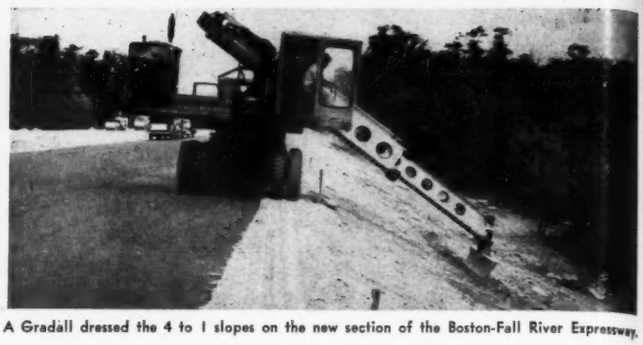
The 4½-inch course of trap rock for the macadam base was penetrated with a 1.75-gallon application of asphalt per square yard, covered with peastone, and then rolled. *C. & E. Photos*



A Gradall dressed the 4 to 1 slopes on the new section of the Boston-Fall River Expressway.

Flexible Pavement

(Continued from preceding page)

struction Co. moved in during the fall of 1951 and immediately began clearing the area with one and two-man Disston chain saws. Large stumps were pulled out with a Bucyrus-Erie clam and hauled off the job.

Dock drilling was done with 4 Worthington wagon drills. They were supplied with air from 2 Worthington 500-cfm compressors and a Jaeger 600-cfm compressor. Holes were drilled with Timken carbide bits ranging up to 2½ inches in diameter. The deepest holes were 24 feet deep and on 4-foot centers.

Hercules 40 and 60 per cent powder was loaded into the holes within 4 feet of the top. Generally, 200 holes were shot at one time. This was done with delay fuses, 40 to a series.

Excavation

Moving over 1,000,000 yards of earth and rock required a sizable fleet of equipment. The contractor brought in five 2½-yard Northwest 80D shovels, and excavated up to 2,000 yards per day with each unit. Hauling equipment consisted of 11 bottom-dump, four 11-yard end-dump, and four 16-yard end-dump Euclids, and 14 Sterling dump trucks. Fill was spread in 1-foot lifts and compacted by the regular earth-moving equipment.

Where scrapers could be used, the contractor brought in 2 LeTourneau's and 2 Bucyrus-Erie's. Other earth-moving equipment included a Northwest Model 6 dragline, a 2-yard Lima crane, and 10 Caterpillar dozers.

Gravel subbase was obtained from a pit about 1 mile from the job. Over 240,000 cubic yards were required for the job. Compaction was achieved with two 20-ton and two 12-ton Buffalo-Springfield rollers.

The 2-inch trap rock was supplied by the New Haven Trap Rock Co. It was brought in by car on a special railroad spur line and loaded directly into trucks. The contractor built a timber trestle under the tracks in which trucks could be loaded. This material was hauled an average of 2 miles with six 7-yard Sterling dump trucks. Peastone was also brought in by rail, but was stockpiled at the site and loaded with a Fordson front-end loader.

Trap rock was spread with Caterpillar graders and then compacted 4½ inches thick. It was then penetrated with 85 to 100 asphalt 1¾ gallons per square yard. A Buckeye spreader covered this with peastone, and the surface was rolled again. A Gradall unit was used to dress slopes and also for drainage work.

Hot-Mix Top

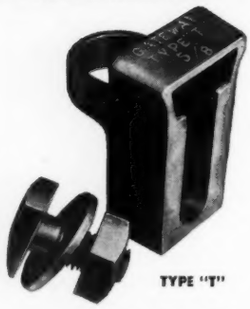
One of the most interesting features of the work was the fast job of laying the 2½-inch-thick hot top of bituminous concrete. Thomas Brothers Corp., of Middleboro, Mass., subcontractor for the hot top, had only 38 working days to lay 5½ miles of 6-lane pavement.

Mario Grassi, Superintendent for Thomas Brothers, operated on a 6-day-week schedule. He used a Barber-Greene finisher and fed it almost continually from five 20-ton Fruehauf trailers and six 12-ton Sterling trucks. The average haul was 16 miles.

Thomas' Hetherington & Berner 4,000-pound asphalt plant in Raynham turned out 120 tons per hour

Shelf Angle Insert

Dovetail Anchor Slot and Anchors



TYPE "T"

MALLEABLE IRON SHELF ANGLE INSERT used for supporting shelf angles to carry brick veneer or other types of wall facings. A special askew head bolt, nut and washer is furnished with each Insert: Two sizes: ⅝" and ¾".

BRICK ANCHOR (BA)

STONE ANCHOR (SA)

DOVETAIL ANCHOR SLOT

Dovetail Anchor slot comes with a filler which makes it completely clog-proof with no chance of concrete getting inside. It is made of 22 or 24 gauge galvanized stock.

Manufacturers and Distributors

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CONCRETE JOIST CONSTRUCTION

RENTAL and ERECTION SERVICE

Ask for Catalog No. 3100

★ Low Cost Form Work
★ Fire Proof
★ Long Spans
★ Standardized Sizes
★ Flexible in Design

Gateway offers two types of Metal Pan Systems to contractors: The Nailed-Down System and the Gateway "Slip-In" System. A complete manual of erection details is available by contacting the nearest Gateway office. Centering erection is a "Gateway" specialty. 100,000,000 sq. ft. of Form Area installed, is Gateway's guarantee of service, reliability and responsibility.

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Eliminate 70% to 90% of Conveyor Downtime

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Built by IOWA

MOTORIZED HEAD PULLEYS

eliminate maintenance on chains, belts, sprockets, Univer... drives, countershafts...

EVERYTHING is contained INSIDE the pulley shell!

HERE'S a money-saving departure from conventional conveyor drives. A Cedarapids-Schrock *Motorized* Head Pulley is simply a new application of the long-proven gear reduction drive, with everything . . . electric motor, reduction gears and all moving parts . . . contained inside the drum, completely protected from grit, dirt and weather and with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime is saved by eliminating the exposed parts necessary with conventional pulley drives. In operation, the pulley shell rotates about the electric motor which is held stationary by a torque arm attached to the conveyor frame. The speed of the shell depends on the combined reduction ratio of the pinions and gears inside the shell. Compact, easy-to-install, job-proved Motorized Head Pulleys are available in sizes from 5 to 30 HP and in various widths.

Find out all the advantages of converting your belt conveyor or belt-bucket elevator installations to *motorized* efficiency before you need head pulley replacements. See your distributor today, or write for Bulletin MP-1.

IOWA MANUFACTURING COMPANY Cedar Rapids, Iowa, U. S. A.

Built for sale in Arizona, California, Nevada, New Mexico, Southern Oregon, Southwestern Utah and Texas by

YUBA MANUFACTURING CO. (Pulley and Sprocket Department) Benicia, Calif.

New Soil Conditioner Controls Erosion

A synthetic soil conditioner which is said to help control rain and wind erosion on construction sites, levees, and right-of-ways is available from the Organic Chemicals Division of Monsanto Chemical Co., 1700 S. Second St., St. Louis 1, Mo. Bondite soil conditioner stabilizes aggregates on the soil surface to hold the seed and soil in place until the vegetative cover germinates and becomes established. According to the company, the conditioner is ordinarily effective at the rate of 1 pound per 100 square feet, or 436 pounds per acre. It may be applied as a powder or as a water solution.

The conditioner should be used in conjunction with seeding operations during most favorable months of the spring and fall planting seasons. A mobile spray unit for applying the soil conditioner, seed, and fertilizer in one operation has been developed by the company with the cooperation of the Connecticut State Highway Department.

There are limitations, the company points out, to the kind of soil and the steepness and length of slope on which the conditioner is effective. The degree of slope should be about 2:1 or flatter, and the length of the slope should be 50 feet or less.

The new product is said to have advantages over surface mulches. It is easier to apply, it is not flammable, and will resist wind. In addition, it is available in areas where mulches are not readily obtained and costs less to transport, store, and apply.

For further information write to the company, or use the Request Card at page 18. Circle No. 240.

A mobile unit especially designed by the company sprays a slope with the new Monsanto Bondite soil conditioner, and applies seed and fertilizer at the same time.

Refinery in Argentina

A new catalytic refinery for Yacimientos Petroliferos Fiscales at Eva Peron (formerly La Plata), Argentina, is nearing completion. Designed by M. W. Kellogg Co., subsidiary of Pullman Inc., New York City, N. Y., and constructed by YPF, the plant will be called the Presidente Peron Refinery. It will include a fluid catalytic cracking unit, alkylation, and one of the world's largest delayed coking units. There will be two crude units, one of 21,000 BPD capacity and the other charging 7,300. Also being erected is equipment for thermal cracking, straight-run gasoline fractionation, vacuum distillation, and catalytic polymerization.

Welders and specialized-construction technicians are being trained in special schools established for that purpose.

Flexible Pavement

(Continued from preceding page)

to keep up the tight schedule. Over 1,000 tons were laid every day.

Grassi compacted both the 1¼-inch-thick binder course and the 1¼-inch-thick top course with 2 Buffalo-Springfield rollers. A 12-ton tandem made the first passes and was followed by a 15-ton 3-wheel unit.

Weights and per cents for a typical 4,000-pound mix were as follows:

Binder Course

Material	Weight	Per Cent
Sand	1040 lbs.	26
Stone, ¾-inch	560 lbs.	14
Stone, ½-inch	280 lbs.	7
Stone, ¼-inch	1920 lbs.	48
Bitumen	200 lbs.	5
Total	4,000 lbs.	

Top Course

Material	Weight	Per Cent
Sand	1680 lbs.	42
Stone, ¾-inch	1760 lbs.	44
Stone, ½-inch	220 lbs.	5.5
Filler	80 lbs.	2
Bitumen	260 lbs.	6.5
Total	4,000 lbs.	

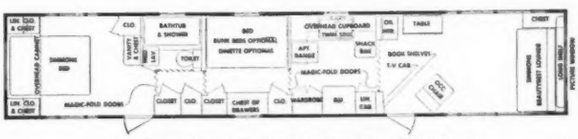
Personnel

Frank Tupper, Superintendent for DeMatteo Construction Co., used 75 men on the grading and macadam work. Mario Grassi, Superintendent for Thomas Brothers Corp., used 11 men on the hot-mix subcontract.

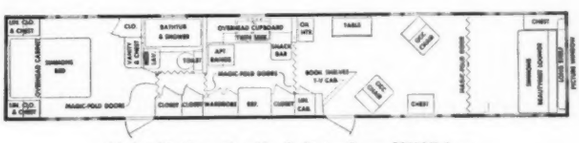
R. A. McIntyre was Resident Engineer on the main contract, and L. N. LaBelle was Resident Engineer on the subcontract. The work was under the direction of William C. Tuttle, Chief Engineer for the Massachusetts Department of Public Works.

IS YOUR WIFE HAPPY?—OR LONELY?

Live with Your Family—"on the Job"



Model 45, Floor Plan No. 1. Living Room 14'3" long.



Model 45, Floor Plan No. 2. Living Room 20'10" long

Model 45, Floor Plan No. 3. Living Room 20'10" long.

Simmons Beautyrest lounge (makes a seamless double bed.) Large picture windows. Duncan Phyfe table. Chairs. Valance boards. Indirect lighting. Draw drapes.

Built in TV cabinet. 9 cu. ft. Westinghouse refrigerator. Deluxe Sunray 4-burner range. Twin ledge type sink with mixer faucet. Large Bowen water heater. Lots of work space, cupboards, cabinets and drawers.

The really complete bath, with full size tub and overhead shower.

Why not have your family with you, as you move from one project to another? Enjoy the best living you ever had in America's finest mobile home—the Pontiac Chief. Study the floor plans above. The pictures and plans are for Model 45. There are other models 40, 35, 30 and 26 ft. long, with many floor plans. One of them will meet your exact needs. You can even have an office in the small bedroom of Plan 1. You will live better, have your family with you and save money by living in your own Pontiac Chief, instead of maintaining one home for your family, and living alone "on the job."

Think it over! It's worth investigating, and a post card will bring you full information, *promptly*, and without obligation.

FREE

Illustrated literature. Shows all models, all floor plans. Describes equipment in detail. Prices include furniture and equipment — beds, lounge, table, chairs, drapes, refrigerator, space heater, gas stove, hot water heater, etc. Easy terms, up to 5 years. Just send name and address for your free copy by mail.

THE PONTIAC COACH CO.

Industrial Division

4618 Dixie — Drayton Plains, Mich.

The Lyon bar, pipe, and rod-steel storage units are available in double-face models for center or open floor use, and single-face units for use against a wall. For further information write to Lyon Metal Products, Inc., Aurora, Ill., or use the Request Card at page 18. Circle No. 245.

Air Coupling Seals Disconnected Hose

New couplings for air-hose connections have spring-seated valves in each end to prevent passage of air when air hoses are disconnected. They eliminate the need to open and close air valves at the compressor tank. When the Twinmatic couplings are connected, the valves butt against one another and depress to permit a free flow of air through the coupling. Underwater tests at 125 psi reportedly show no leakage in either half of the coupling, or in the assembly.

Accidents, caused by high-pressure air remaining in the hose after disconnecting, are eliminated. Since both hose couplings are sealed, foreign particles are prevented from entering and traveling into air tools.

Brass valves and seats are used, and coupling bodies are aluminum.

For further information write to the Twinmatic Corp., 2246 S. Barrington Ave., Los Angeles 64, Calif., or use the Request Card at page 18. Circle No. 218.

Steel-Sheet Piling

How to select steel-sheet piling for construction projects is discussed in a new booklet issued by L. B. Foster Co., a piling-rental company. In addition to giving comparative information on steel-sheet piling manufactured by major steel companies, the catalog also cites the advantages of renting piling.

To help the contractor in estimating a job, one section lists the number of piles required for various wall lengths. Included also are piling data on circular and diaphragm-type cellular cofferdams, circular cofferdams, Z-piling and other connections, and corner pieces. Pile extractors and pile hammers are also discussed.

To obtain this literature write to the L. B. Foster Co., 11 Park Place, New York 7, N. Y., and request Bulletin No. 575 D, or use the Request Card at page 18. Circle No. 200.

Book on Roof Trusses

A new edition of "Simplified Design of Roof Trusses for Architects and Builders" by Harry Parker, Professor of Architectural Construction at the University of Pennsylvania, has been published by John Wiley & Sons, Inc.

The volume was prepared for those who have had no preliminary training in the design of roof trusses. Beginning with simple systems of forces, the theory of graphic statics is evolved, showing application of fundamental principles in constructing stress diagrams for various types of trusses and loading. One chapter treats more advanced trusses requiring special solutions. A new section deals with timber connectors and their application in the design of roof trusses.

The book may be obtained from the publisher, John Wiley & Sons, Inc., 440 4th Ave., New York 16, N. Y., for $4.00.

CHECK THESE IMPORTANT ADVANTAGES OF
McConnaughay Asphalt Emulsions
FOR ROAD-MIX PAVING JOBS

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Knight Paving Products, Inc.
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Providence 7, *Rhode Island*
Seaco, Incorporated
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Muncie, *Indiana*
Bituminous Materials Co.
Terre Haute, *Indiana*
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Terre Haute, *Indiana*
Asphalt Materials and Construction, Inc.
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(Also serving Alabama and Mississippi)
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Above—Dense-Graded Road Mix, Specification No. 5 . . . C.A.A. Airport; inset—Sand-Honing, Specification No. 9 . . . Connecticut Highway Department.

Highly Water-Resistant in ALL Stages

Water and weather are of less concern on road-mix jobs when you use McConnaughay Emulsified Asphalts. Here's why:

These superior emulsions *may be mixed with either wet or dry aggregates*, but give even better results when no water is added. They are little affected by water or rain during construction or after the paving is completed . . . not susceptible to drainage after mixing . . . have excellent adhesive qualities . . . assure quick compactibility after application. These features mean quicker, easier, better paving.

McConnaughay Licensees (a group of long-experienced contractors, material producers, highway engineers, and manufacturers of equipment) have established enviable reputations for producing the *best* emulsified asphalt for each type of construction. Fully equipped to take on complete contracts or provide laboratory facilities, emulsions, and technical services required . . . they work with you closely in solving your problems. *Take advantage of this exceptional service.* If you are figuring on road, street, or general paving, get in touch with your nearest McConnaughay Licensee (list at left) or contact . . .

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST
1—Penetration Macadam, 2—Open-Graded Plant Mix, 3—Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching.

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EMULSIFIED ASPHALT
Plants and Processes
LAFAYETTE 4, INDIANA

Jobs Done Quicker, Cheaper

Attached to Tractors, Bulldozers, Motor Graders and Scrapers, the Automatic Slope-Meters are in use on the construction of highways, airports, dams and building sites. Slope-Meters are compact, sturdily constructed instruments that will automatically show the operator the exact grade or slope on which he is working.

Order from Your Equipment Distributor Today
OR
THE SLOPE-METER CO. EXCELSIOR, MINN.

Front-End Loaders Have Torque Drive And Power Steering

A line of hydraulic tractor-mounted front-end loaders has been announced by The Jaeger Machine Co., 550 W. Spring St., Columbus 16, Ohio. The loaders feature a torque-converter drive that applies the power needed to enter material and fill the bucket in one movement without gear shifting or impact loading.

A 1-cubic-yard model with a static load capacity of 5,000 pounds turns in a 14-foot radius. Its bucket rises to 8-foot 2-inch dumping clearance in 9 seconds. The unit travels at speeds up to 18.7 mph forward and 28.2 mph in reverse.

All operations are under hydraulic control, including power control of the bucket. A float valve is standard. The bucket is wider than the tires to work flush to curbs and walls. In loading, the boom arms crowd the bucket 13 inches forward as it rises. At maximum height, the bucket is 10 feet 4 inches under the hinge and has a reach of 24 inches. At 7-foot dumping clearance, its reach is 34½ inches.

The unit has 13:00 x 24 front tires and rear axle steering with power booster. A 55-hp gasoline or diesel engine at the rear counterbalances the bucket load in front.

The machine has a ground clearance of 12 inches and need for underslung counterweighting is said to be eliminated by making both the front end and rear radiator grille of massive castings.

In addition to the 1-yard unit the company offers models with ⅝-cubic-yard and 1½-cubic-yard capacities. The larger sizes can also be used for prime moving, railroad-car pushing, bulldozing, snow plowing, and operating hydraulic hooks. Four-wheel drive is standard on the 1½-yard model.

For further information write to the company, or use the Request Card at page 18. Circle No. 214.

Electric Testing Ovens

Electric utility laboratory ovens are shown in literature from Soiltest, Inc., 4522 W. North Ave., Chicago 39, Ill. The ovens are made for analytical laboratory and general chemical work, involving baking, drying, conditioning, and preheating.

Ovens described have a temperature range from 100 to 550 degrees. Construction of the housing, insulation, heating element, and heat control are discussed.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 248.

One of Jaeger's line of truck-mounted front-end loaders.

Weatherproof Lights

Literature is available on weatherproof portable lights made by the Stonco Electric Products Co., Kenilworth, N. J. Spotlight holders have aluminum arms and base plates, and porcelain heatproof sockets. A clamp light attaches to any board up to 2½ inches or any pipe up to 2 inches. Other units made by the company include lights with cadmium-plated steel lawn-spikes and the Rolla-Tray light which is mounted on a 10-inch tray and rolls on 3 casters. Cluster lights with wiring trough assemblies are also shown.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 320.

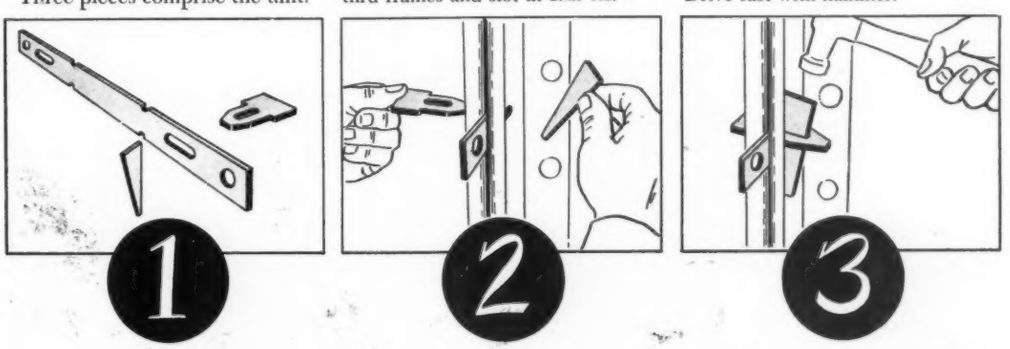
H. W. Jahn Appointed

H. W. Jahn has been named Assistant Sales Manager by Transport Trailers, Inc., Cedar Rapids, Iowa, manufacturer of trailers. Mr. Jahn was formerly associated with C. R. Jahn Co., and more recently with the Jahn Trailer Division of Pressed Steel Car Co.

Three pieces comprise the unit.

Slip panel into position with **FLAT BAR TIE** between panels. Put **KEY WEDGE** thru frames and slot in **BAR TIE.**

Stick **WEDGE** in slot in key wedge. Drive fast with hammer.



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ATLAS COMPO FORMS go up faster, strip easier. Contractors and builders save on form costs and form labor with every use. Panels slip into place without disturbing adjoining panels. No sidewise juggling needed to erect or strip. Start at any or many points.

A pleasure to handle, the largest panel weighs but 75 lbs. But it's TOUGH! Pressed steel channels of our own weight-saving design, frame and reinforce plastic-faced plywood. The plastic plywood faces have been re-used 40 times before reversing. And split rivets make reversing or replacement easy.

No walers needed, no wooden wedges, no nail-driving. One row of a pair of 2 x 4's takes care of maintaining alignment under pressure. Liners go up in a jiffy, thanks to our exclusive liner clamp which hooks on to bar tie.

Right now we're printing a CONCRETE CHECKER—"what to check before you pour." Use the coupon to get this handy wall card and more information.

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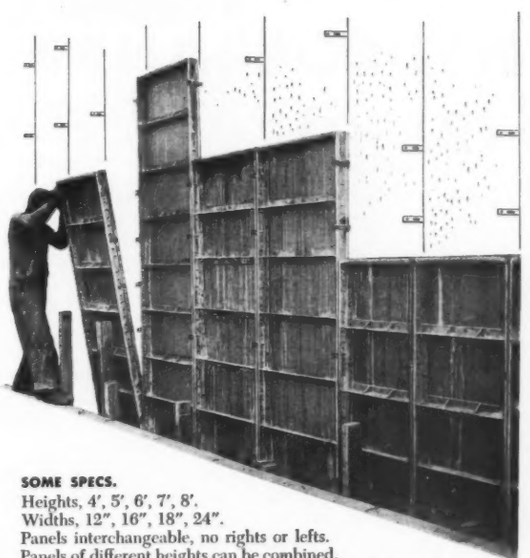

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Heights, 4', 5', 6', 7', 8'.
Widths, 12", 16", 18", 24".
Panels interchangeable, no rights or lefts.
Panels of different heights can be combined.
For low, high, round, rectangular structures, and for slabs.
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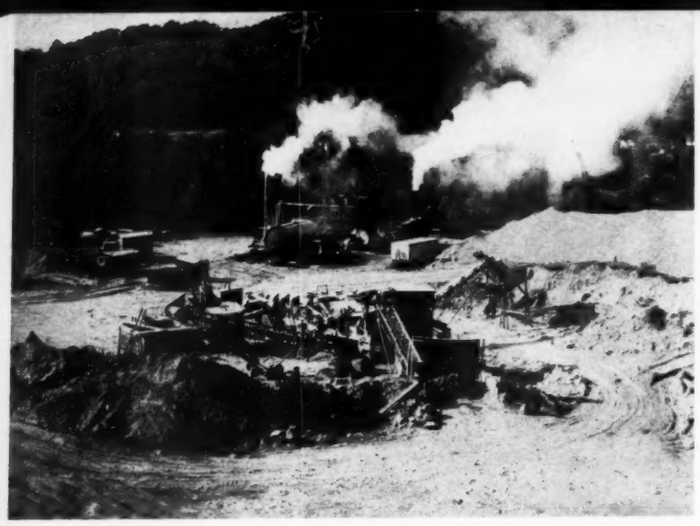


Taken from the top of the gravel bank, this photo shows the complete asphalt-plant layout. In the foreground, crushing and screening equipment prepares sand and stone, and in the background the Pioneer continuous-mix plant turns out bituminous concrete. *C. & E. Photo*

Portable Asphalt Plant Speeds Resurfacing Job

Contractor Salvages 12 Miles of Old Concrete Highway In Southern Vermont with 2½ Inches of Plant-Mix

• ADVANCE planning, coupled with effective use of portable equipment, streamlined a long blacktop resurfacing operation this year in southern Vermont.

W. H. Hinman & Co. of N. Anson, Maine, had the job of salvaging 11 miles of worn-out concrete pavement between the towns of Bennington and Pownal. The $172,000 contract called for a 2½-inch-thick bituminous concrete resurfacing of the old 18-foot-wide U. S. 7. A 1-foot-wide premix shoulder on each side was also specified to provide a modern 20-foot-wide surface. The job was broken up into two sections; the upper 9.7-mile section was built entirely with state funds, while the lower 1.26-mile section is a Federal-Aid project. The total contract price for the two sections is $317,520.75.

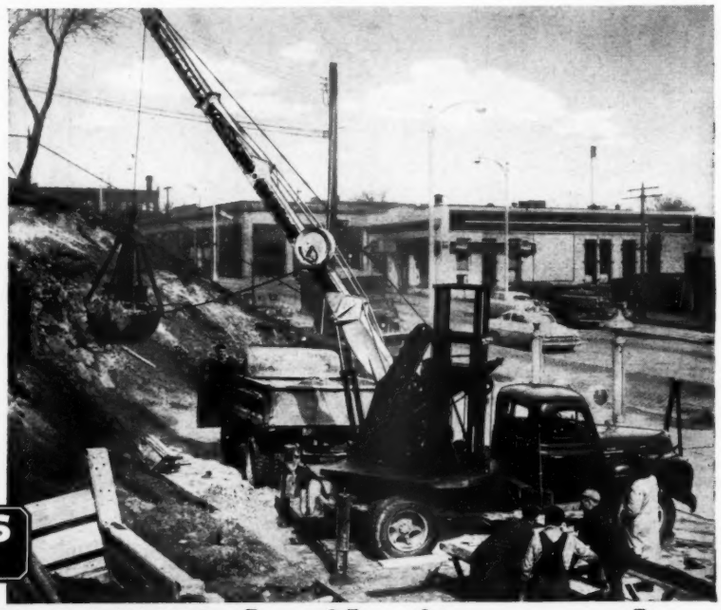
The contract was awarded by the Vermont Department of Highways late in the summer of 1952. Work began soon afterwards and continued until the winter shutdown. The job was completed this spring.

Hinman's reconnaissance engineers were first sent out to determine the best method of acquiring the aggregates and handling the hot-mix. Because material suppliers in the sparsely settled region were few and far between, they made plans to set up their own plants.

Fortunately, an excellent bank of gravel was located right in the middle of the job and only ½ mile from the road. The material in the bank ranged from fine sand to medium-size boulders, providing the complete range of aggregates.

Portable Equipment

Opening the bank and getting crushing and mixing equipment working in it was the next problem. Hinman had just completed hot-mix work in Maine, and he hauled the job's Pioneer portable crushing and mixing plants over 300 miles to the new job in southern Vermont. The complete trip, including dismantling



Here the Hydrocrane excavates for a retaining wall. Boom reaches out for extra passes — without moving truck an inch! Quick-set outriggers provide outstanding machine stability . . . even permit the ¾-yd. clamshell bucket to be handled with a flat boom, fully extended. Every crane function fully hydraulic. Travels up to 50 mph on open road. Simple hand levers — no foot brakes.

BUCYRUS ERIE

HYDROCRANE'S built-in reach grabs the "EXTRA-DOLLAR" jobs

Bucyrus-Erie Hydrocrane with hydraulically telescoping boom gives you 8 ft. more boom — right at your fingertips. This special extend-retract action means extra dollars in savings on regular jobs . . . extra dollars in profits on special jobs ordinary outfits can't handle. Look:

1. *On erection work* boom reaches between girders . . . hoists concrete buckets, planking, etc., to upper stories . . . saves hundreds of man-hours.
2. *On road work* telescoping boom reaches under branches, over obstructions while handling pipe, culvert, or levelling shoulders . . . moves material into tunnels and low underpasses . . . handles dozens of close-quarter jobs.
3. *On yard work* reaches into boxcars . . . over fences . . . between stockpiles to move material, load trucks, etc., in a hurry.

QUICK CONVERTIBILITY TO *HYDROHOE*

By actual stop watch test, crane has been converted to drag-shovel front end by one man in *less than one hour!* And on trenching, telescoping action of Hydrohoe boom cuts lost time moving up as much as 40 percent.

Get the full story on the all-hydraulic Hydrocrane with its many attachments.
SEND COUPON TODAY

Here the Hydrohoe starts a trench cut. Available with either 12- or 18-inch dipper—equipped with hydraulic ejector that kicks dirt out.

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South Milwaukee, Wisconsin

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and setting up, required about one week.

The pit had already been opened up with a Bucyrus-Erie 15 B shovel. Dozers graded the working area into 2 levels—a higher one next to the banks on which the shovel and trucks could operate, and a lower one for the crushing and mixing plants.

A wood-frame hopper with mechanical feeder was set up at the edge of the higher level. Trucks stocked the hopper as conveyors below carried the material to the crusher, where it was converted to sand, ½-inch, or ¾-inch crushed gravel.

Conveyor-fed hopper bins on each side of the crusher were kept stocked with aggregates. Trucks loaded up under the hoppers and then hauled the sand or stone to the stockpiles. When sufficient material to complete the job was stockpiled, the crusher was removed.

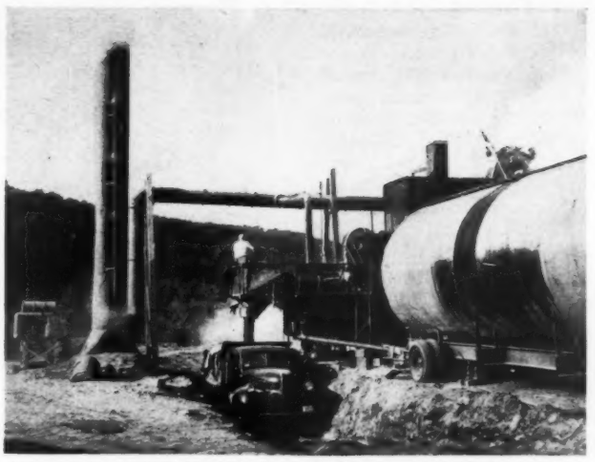
Continuflo Plant

The focal point of the operation, however, was the Pioneer Model 51 continuous-mix asphalt plant. It had been transported over 300 miles travelling in 10 separate sections. Soon after it was set up, production reached 500 tons per day.

Here is how the asphalt plant operated.

Dozers worked on the stockpiles keeping material in reach of the Link-Belt Speeder clamshell, which stocked a 3-compartment bin. One compartment held sand, one stone, and one held both. A Syntron F-44 feeder with a V-75 vibrator controlled the flow of material from the bin. This feeder operated electrically, and its rate of flow could be easily adjusted at the plant by the operator.

The raw and cold aggregates were then sent to the 72-inch-diameter 24-foot-long drier. Here they were dropped through a chute and spread out in a swirling pattern across the width of the drum. Horizontal flights tumbled the material as it traveled to the lower end, where it discharged into the hot elevator.



This steam-cylinder-operated hopper permitted trucks to be loaded with the accumulated mix, instead of allowing the mixture to flow freely from the mixer to the truck. The 15,000-gallon asphalt-storage tank is at the right.

C. & E. Photo

Reclaims Dust

Heat was supplied by a Ray burner and drawn through the drier with a fan. Most of the dust was reclaimed by a multiclone collector, and the remainder went up the stack with the hot gases.

The aggregates were carried by the hot elevator to the 2½-deck vibrating screen where they were separated into 3 sizes and then fed through calibrated gates to the mixer elevator. The correctly proportioned aggregates were then premixed, sent through the hot bitumen spray, and passed into the twin pugmill. All drives were interlocked to prevent variation from the specified volumetric proportions.

At the end of the cycle, a steam-cylinder-operated hopper permitted trucks to be loaded with the accu-

(Concluded on next page)

Home is where you take it!

Quality built and design-engineered to guarantee a lifetime of living pleasure, HOWARD all-steel insulated Mansion Coach homes deliver the most in value—always! Enthusiastic owners from Alaska to Florida voluntarily testify to the low upkeep and high trade-in value of these time-tested HOWARD Mansion Coach homes. There's a model designed to meet every family requirement at your nearest HOWARD Dealers, see it now! For further information, write: Department 20 BOX 2163

HOWARD INDUSTRIES, INC.
SAGINAW, MICHIGAN

Choose the hoist with 9 lives...

CHOOSE HERCULES—Whatever the type or capacity of the next dump truck hoist you buy, the name HERCULES is your strongest guarantee of top performance and long life. From coast to coast, Hercules Hydraulic Hoists are favorites because they have earned the reputation of having 9 *lives*. Owners are continually amazed at the ability of Hercules Hoists to withstand severe use and to outlast other makes without repair.

One of the famous Hercules Hoists is the Model 100 for 8 to 11 ft. dump bodies. Here are nine reasons why the Model 100 has nine lives, and why you should make it your next choice in this work range:

1. Takes more overloading
2. No cramping nor strain on hinge bolts.
3. Lift arm design keeps body from tilting farther than intended.
4. No hoist stresses except direct lift transmitted to truck frame.
5. Uniform oil pressure.
6. Maintenance requirements are minimum.
7. Every part can "take it"—no Achilles' Heel.
8. Precision built of highest quality materials.
9. Rigidly inspected at every step of production.

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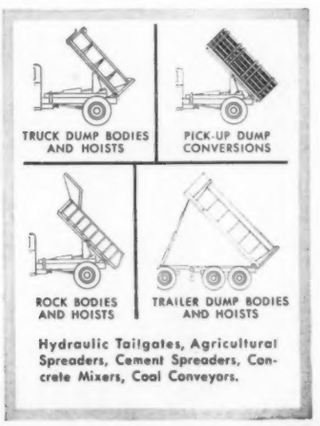
Hercules

HOISTS AND DUMP BODIES FOR EVERY NEED



Hydraulic Tailgates, Agricultural Spreaders, Cement Spreaders, Concrete Mixers, Coal Conveyors.

HERCULES STEEL PRODUCTS CORPORATION • GALION, OHIO

Portable Asphalt Plant Speeds Resurfacing

(Continued from preceding page)

mulated mix, instead of allowing the material to flow freely from the mixer to the truck.

The 85 to 100-penetration bitumen was furnished by Socony-Vacuum Co. It was hauled in 3,000-gallon trailers by D. J. Cronin from E. Providence, R. I. Three trailers were required to keep the plant supplied.

A 3-inch Worthington pump transferred the bitumen from the trailers to the 15,000-gallon storage tank. A Cleaver-Brooks 3-car heater circulated steam through the insulated coils jacketing the tank.

The Barber-Greene finisher lays blacktop on a Vermont highway. W. H. Hinman & Co., of N. Anson, Maine, was the contractor on the job. *C. & E. Photo*

Truck loading followed a merry-go-round system to prevent tie-ups. Trucks circled back of the pugmill dust stack, entered the ramp, cut under the hopper, loaded, and then passed over the Howe scales. On an average, twelve 8-ton trucks were required.

To maintain a constant check on the efficiency of the operation, the man at the scale plotted tons against minutes at 5-minute intervals. The efficiency was computed on the basis of the maximum rate in any one hour divided by the rate per hour. This check was made every day to determine methods of improving efficiency.

Paving

Out on the road, the surface was first tack-coated with emulsified asphalt applied with a Littleford 55-gallon distributor. The 10-foot-wide strips of bituminous concrete were laid with a Barber-Greene Finisher. Compaction was achieved with a 3-axle 15-ton, and a tandem 10-ton Buffalo-Springfield roller.

The 1½-inch base course was graded as follows:

Stone, ⅝—¾-in.	15 per cent
Stone, 3/16—⅝-in.	40 per cent
Stone, 3/16 in. and less	45 per cent

The bitumen used was 5½ per cent by weight of aggregate.

The 2½-inch-thick pre-mix shoulder consisted of stone up to 1¼ inches with 50 per cent passing the ¼-inch sieve. It was mixed with cutback asphalt.

Resurfacing Program

The job was part of a general Vermont Department of Highways program of replacing worn-out concrete roads with bituminous concrete. Many miles of such roads, built during the late 1920's and early 1930's, have begun to show their age. But most of them still provide an excellent base for resurfacing. The program has already salvaged 188 miles of old pavement, and another 26 miles are scheduled for such treatment this year.

Personnel

Charles F. Parker, Chief Engineer, and R. P. Barstow, Superintendent for W. H. Hinman, directed the work. G. Cunningham was Field Inspector, and K. Odell, Plant Inspector for the Vermont Department of Highways.

Ivor S. Pelsue was District Engineer for the Department of Highways, which is headed by Hubert E. Sargent, Chief Engineer.

You can save a life by ordering a $10 CARE food package for delivery to a needy person overseas. Send a contribution to CARE, 20 Broad St., New York 5, N. Y.

Use Swenson self-feeding material spreaders for fast, easy application of salt, chloride, sand, cinders, gravel or a combination of these materials

Free Information

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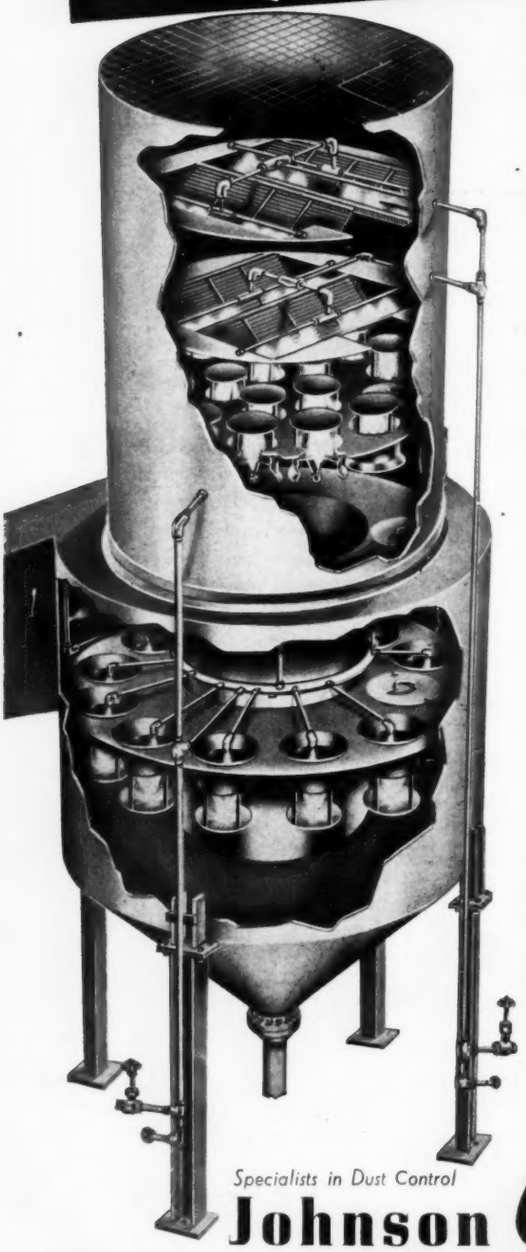
stop air pollution



with an "LP"

"MULTIPLE-ACTION" SCRUBBER*

• Six different principles incorporated into a single unit make the Johnson-March "LP" Multiple-Action Scrubber the most efficient yet developed for removing dust from stack discharged gases. "LP" Scrubbers are particularly adapted to the control of dust in asphalt plants, limestone plants and wherever stack dust is a problem.

The Johnson-March "LP" Scrubber employs many unique features not found in any other equipment which insure final removal of the low and sub-micron dust particles.

Look at these Advantages...

- **Completely portable . . . easily assembled and relocated**
- **Low back pressure—use with your present fan equipment**
- **Uses less water. Water can be recirculated**
- **Durable, heavy steel plate construction**
- **Low maintenance**
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*Pate Pending

C&E-1

THE JOHNSON-MARCH CORP.
1724 Chestnut St., Philadelphia 3, Pa.

Without obligation, I'd like to know more about the use of the Johnson-March "LP" Scrubber in my plant. Please send me the FREE BROCHURE.

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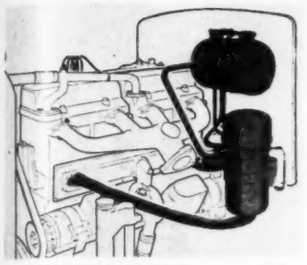
Specialists in Dust Control

Johnson March 1724 CHESTNUT STREET PHILADELPHIA 3, PA.



The Swingheater installed on an engine.

Jet-Pulse System For Pre-Heater

The German "buzz bomb" (V-1) did not bring victory to Hitler in his Blitzkrieg, but it has had its peacetime uses. German scientists adapted the principle used in the self-igniting impulse duct engine of the V-1 and produced a heater which supplies pre-starting heat to internal-combustion engines. The Swingheater is introduced to this country by Devenco, Inc., 150 Broadway, New York 38, N. Y. In the numerous tests to which the unit has been subjected, the company claims that it has raised engine temperatures from minus 70 degrees F to operating level in satisfactory time.

The Swingheater is said to make for a sure start with no battery drain in abnormally low temperatures. It is attached to an engine's cooling system by intake and outlet pipes, and the heat produced (20,000 Btu per hour from 1½ pints of gasoline) is conveyed into a spiral exhaust tube surrounded by a liquid coolant. Acting on the thermo-siphon principle, the heated coolant circulates directly through the motor. The unit, which has a safety device for automatic prevention of overheating, weighs 14 pounds, and its fuel tank has a capacity of 1½ gallons.

When equipped with a standard heat exchanger, the Swingheater can simultaneously heat an engine and the interior of the cab or body, Devenco points out. Another use is as a self-contained unit, in which capacity it can heat tents, cabins, huts, and similar installations.

For further information write to the company, or use the Request Card at page 18. Circle No. 319.

Truck Tailgate-Loader

A new bulletin describes the Galion Load-evator, a hydraulic truck tailgate and loader. The literature features a brief specification chart that helps the user to select the model best suited to his needs. Action photographs, mounting diagrams, complete technical data, and operating hints are included.

To obtain this literature write to the Galion Allsteel Body Co., Galion, Ohio, and request Bulletin L-6911, or use the Request Card at page 18. Circle No. 246.

Gar Wood Appointments

D. J. Byrd has been named Division Assistant Sales Manager of Wayne Division, Gar Wood Industries, Inc., Wayne, Mich., manufacturer of scrapers and bulldozers. In this position, Mr. Byrd will be responsible for Gar Wood's field operation. The new Division Purchasing Agent for the division will be Wray Kephart.

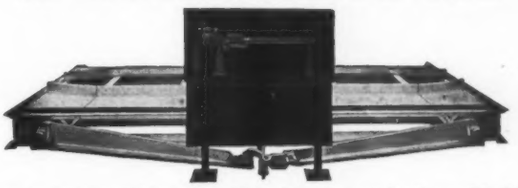
M-C&S Overseas, Inc. Has New York Office

New offices to serve as headquarters for Merritt-Chapman & Scott Overseas, Inc., have been opened in the Empire State Bldg., 350 Fifth Ave., New York, N. Y. The company, a wholly-owned subsidiary of Merritt-Chapman & Scott Corp., 260 Madison Ave., New York 16, N. Y., is responsible for the planning and development of construction operations abroad. The new address provides centralized headquarters for these activities.

In anticipation of further expansion and acceleration in its construction work abroad, Merritt-Chapman & Scott Overseas, Inc., has named Ralph E. DeSimone to serve as President and Board Chairman with responsibility for programming these new projects.

Merritt-Chapman & Scott Corp. further announced that it had approximately $144,000,000 in construction work ahead on its books, which is an all-time high for the 93-year-old company—World War II excepted—and an increase of about 73 per cent over the $83,000,000 figure of a year ago.

WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY
P. O. Box 1198 Terre Haute, Indiana

4 Powerful Reasons why costs go down with CHEVROLET ADVANCE-DESIGN TRUCKS on the job

EXTRA POWER WITH ECONOMY! More hauling power, greater economy! That's the result of new 7.1 to 1 compression ratio of improved Loadmaster engine on 5000 and 6000 Series heavy-duty and forward control models—optional on 4000 Series heavy-duty trucks. Thriftmaster engine in light- and medium-duty models provides traditional Chevrolet economy.

ENGINEERED FOR THE JOB! With Chevrolet, you buy a truck that is exactly right for the job. Not too big. Not too small. You get a truck engineered from the ground up with your job in mind—with the right tires, springs, axle, clutch and engine. You get a truck that will stick on the job day after day, and do your work at lowest cost.

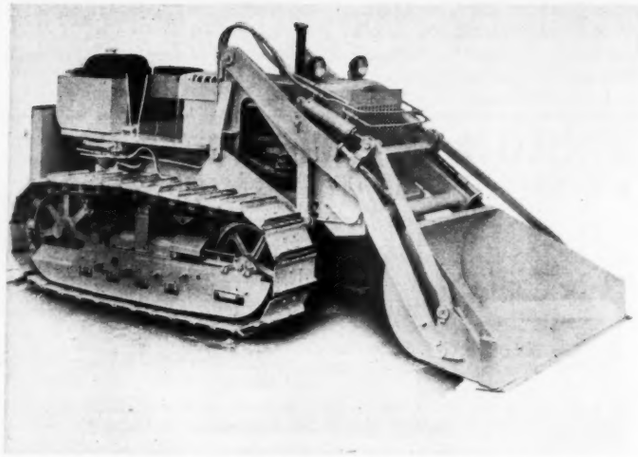
BUILT TO LAST! The extra-sturdy construction of Chevrolet advance-design trucks means longer life, even lower costs. Now, Chevrolet trucks are brawnier than before—with heavier, more rigid frames, with greater ruggedness and stamina built right in. These are the toughest and the sturdiest Chevrolets ever.

THE LINE LISTS FOR LESS, TOO! With all the solid superiorities that Chevrolet offers—with all their special features and advantages—this great line of haulers lists for less than any other trucks of comparable size and specifications. See your Chevrolet dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTIPANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.

CHEVROLET first in demand in value in sales



The Terraloader, new crawler-mounted front-end loader, comes in 3 models with drawbar-horsepower ratings of 26.3, 29, and 30. For further information write to the American Tractor Corp., 800 Fort Wayne St., Churubusco, Ind., or use the Request Card at page 18. Circle No. 221.

Wire-Rope Cutter

A hammer-type wire-rope cutter is offered by Morse-Starrett Products Co., 1204 49th Ave., Oakland 1, Calif. Main components are base, plunger, die, and blade. An advantage of the hammer-type cutter, according to the manufacturer, is the easy replacement of worn or damaged parts.

Three models are available. The Model 1 has a rope capacity of 1 inch and is designed to be carried in a kit bag for occasional rope cutting on the job. It is not recommended for continuous cutting on rope over ⅝ inch in diameter. Two heavy-duty models have 1 1/16 and 1½ inches capacities.

The company also makes a cable band of pliable steel. It is indented with a groove and lock seam at one edge and is made in lengths and sizes that will fit cables ranging up to 1½ inches in diameter.

For further information write to the company, or use the Request Card at page 18. Circle No. 255.

Rubber-Tired Tractor

A pneumatic-tired tractor is shown in a folder from the Harris Mfg. Co., Stockton, Calif. The Harris 4-wheel-driven tractor is available either in a forward or reverse model. Either type can be had powered by a Chrysler 6-A or 8-A gas engine or a G.M.C. 2-71 diesel engine. Drawbar horsepower with each engine is 45, 50, and 40 respectively. There is also a choice of 2 transmissions.

Over-all height of the unit is 67½ inches and its length is 103½ inches. The tractor has a 54-inch wheel base and a ground clearance of 16¾ inches.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 332.

Kratzert to Represent

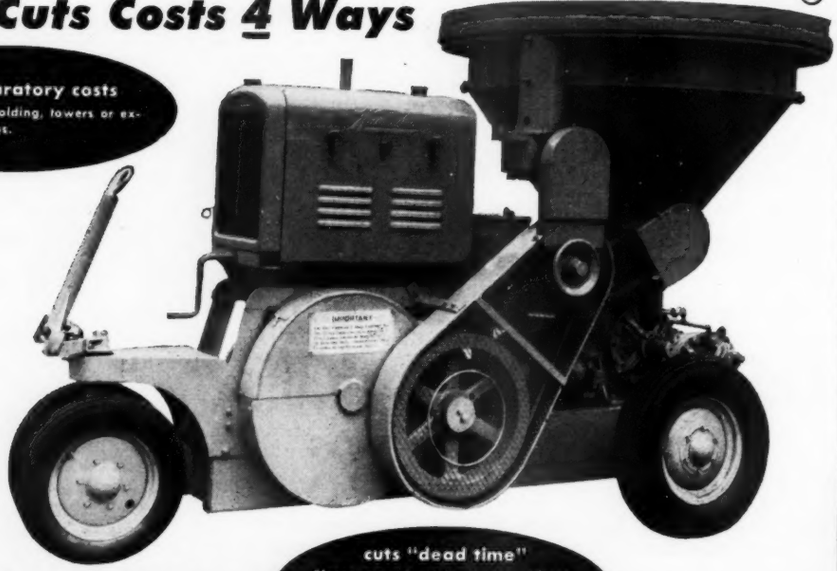
W. A. Kratzert has been appointed State Engineer Representative for Universal Concrete Pipe Co., Columbus, Ohio, manufacturer of concrete pipes, forms, and block machines. Mr. Kratzert will serve the company plants and offices in Florida, including Miami, St. Petersburg, Tampa, Tallahassee, and the affiliated Florida Concrete Pipe Co. located at Ocala.

cuts direct labor costs
Transports, elevates and places concrete in one operation.

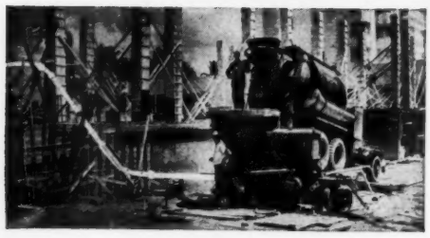
REX PUMPCRETE®

Cuts Costs 4 Ways

cuts preparatory costs
No trestling, scaffolding, towers or expensive buggy runs.



cuts "dead time"
Places concrete while plumber, carpenters, formsetters, etc., are at work. No interference. Steady flow.



cuts non-productive moving time
No need to move mixing equipment. Just spot Pumpcrete® at best place and leave it there.

Find out how pipe line flexibility can pay off on your jobs. See your local Rex Distributor or write to Chain Belt Company, 4666 W. Greenfield Ave., Milwaukee 1, Wis.

CHAIN BELT REX COMPANY CONSTRUCTION MACHINERY

THE Quinn Standard FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request. Also manufacturers

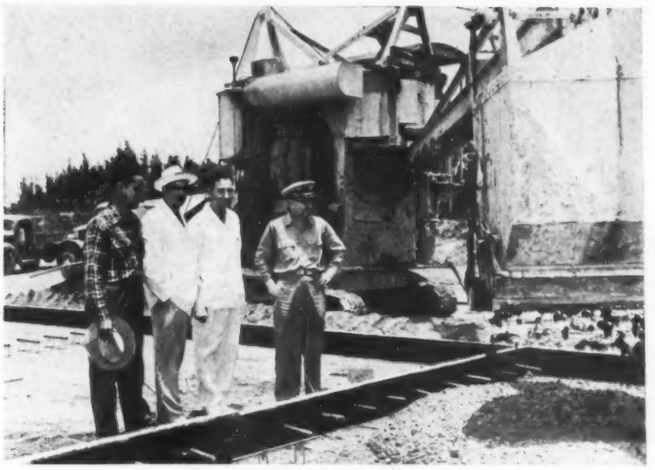
QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1645-1731 BOONE

Building an Airport For Puerto Rico

Industrial and Business Expansion on the Island and Tourist Influx Increase the Need for a New Airport

By ALBERT S. KESHEN



Watching the Koehring Twinbatch paver at work are (left to right): Hector A. Pinero, Vice President, Zequeira & Pinero, Inc.; Xavier Zequeira, President of the company; Salvador V. Caro, General Manager of the P. R. T. A.; and H. L. Matthews, CEC, USN.

• PUERTO RICO is experiencing an industrial and business expansion in an effort to keep up with and thus counteract the island's rapid population growth. A plan is being directed by the Economic Development Administration, better known as Fomento.

This agency is encouraging the establishment of new factories, principally branches of mainland state concerns. Inducements offered, among others, are tax exceptions until 1959, official guidance in getting started, and the advantages of a large labor reserve.

As a result of this impetus the Commonwealth, which has depended and still does depend primarily on an agricultural economy, is experiencing a major change in its development. New plants with their official identifying posters picturing Fomento's trademark of a workman turning a wheel, are becoming more and more frequent. More than 225 plants have been created since the initiation of the program in 1948 and still the rate of acceleration is increasing.

As a result of this expansion, the San Juan airport at Isla Grande, principal air gateway to the island, is quickly becoming obsolete. This site, considered the busiest in Latin America, has been breaking traffic records every month since 1948. At present an average of more than 1,000 passengers clears that airport daily.

The task of providing new and larger facilities was delegated to the Puerto Rico Transportation Authority, a governmental corporation. This resulted in a project for a new International Airport designed to handle the heaviest aircraft and expected to provide an additional stimulus to the growing volume of air traffic.

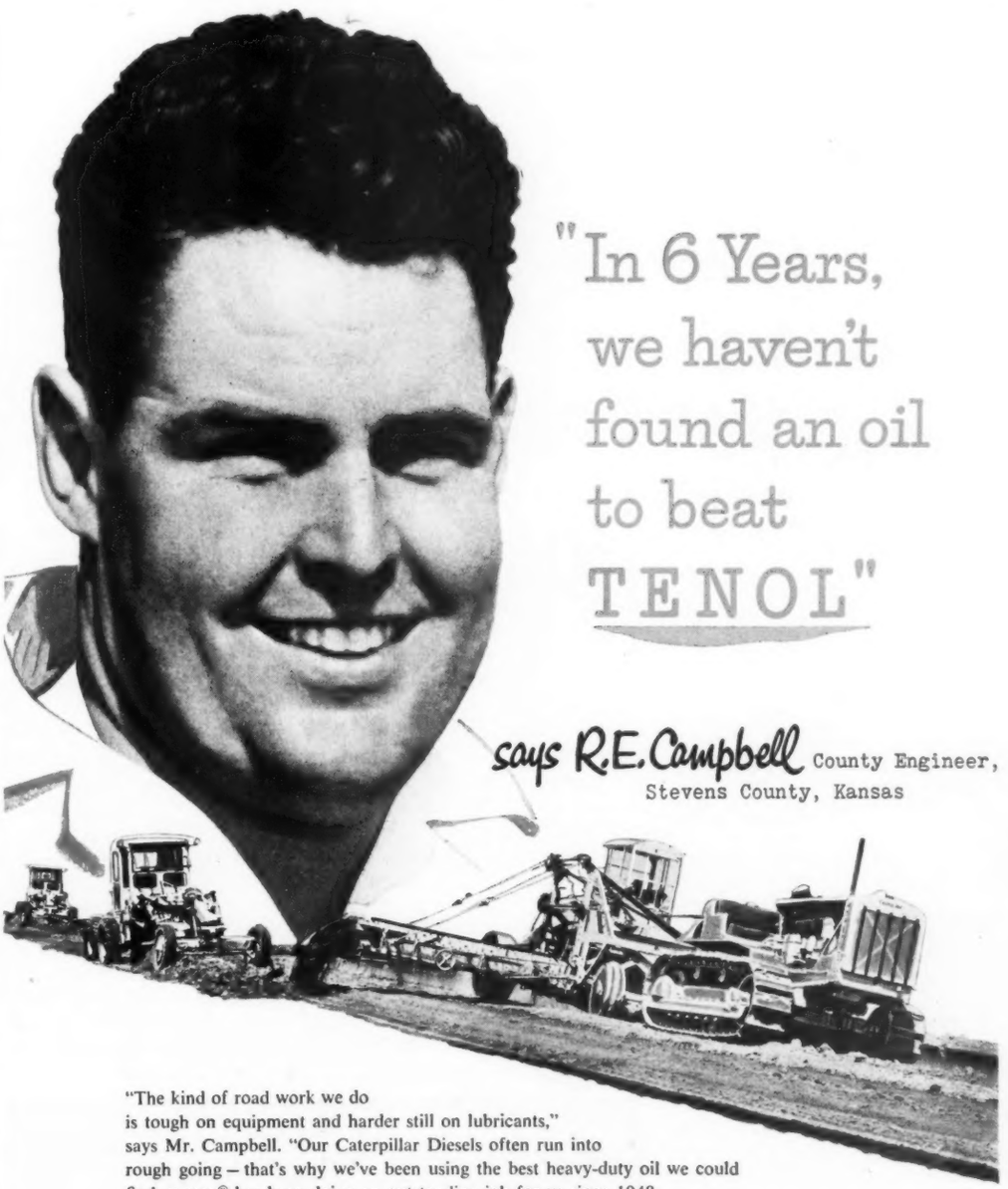
(Continued on next page)

Free bulletin shows how NEW Arcair TORCH gouges, grooves, cuts, bevels all metals at lower cost!

Here are facts and photographs that demonstrate the time and money saving performance of the Arcair Torch in metal fabricating plants, foundries and for many kinds of maintenance work. Arcair uses only electric arc and compressed air, operates at far lower hourly cost than other processes.

Write for Bulletin 6Z

Arcair COMPANY
2614 Burwell St. Bremerton, Wash.



"In 6 Years, we haven't found an oil to beat TENOL"

says R.E. Campbell County Engineer, Stevens County, Kansas

"The kind of road work we do is tough on equipment and harder still on lubricants," says Mr. Campbell. "Our Caterpillar Diesels often run into rough going – that's why we've been using the best heavy-duty oil we could find. TENOL® has been doing an outstanding job for us since 1948 – it has helped prevent sticking valves and rings – it has done an excellent job of keeping our engines free from sludge and carbon."

By experience Mr. Campbell *knows* that Sinclair markets only top quality products. That is why Sinclair products are used 100% on his equipment. Why don't *you* discover the many advantages of Sinclair lubricants? Phone your Sinclair Representative or write Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.

SINCLAIR TENOL prolongs engine life

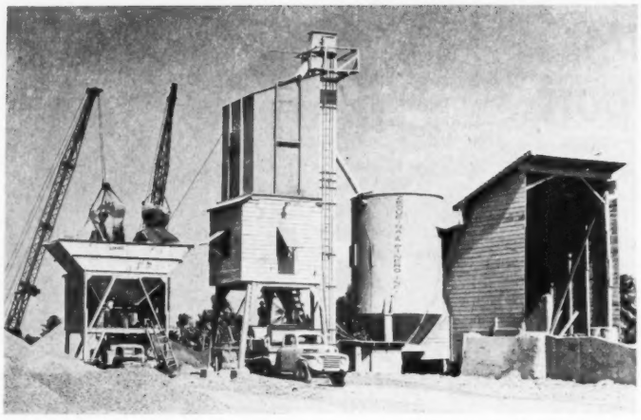
Building an Airport For Puerto Rico

(Continued from preceding page)

Costs

The airport is being built at a cost of around $15,000,000 of which one-third comes from Federal government sources, with the Commonwealth government providing the balance. The runway, 7,800 feet long, which has already been completed, makes the new site useful for the latest development in passenger planes. Contracts have been let for installation of basic utilities such as water supply, sewage systems, etc., at a cost of $700,000, and the Transportation Authority is preparing contracts for paving aprons and taxiways estimated at $1,000,000.

The terminal building will take about $3,500,000 of the present funds, while removal of radio-antenna obstacles, construction of police and fire department stations and a cargo building will require at least $400,000.



Two Lorain cranes are loading aggregate into a Blaw-Knox 3-compartment bin. The cement bin is at the right.

Location and Clearance

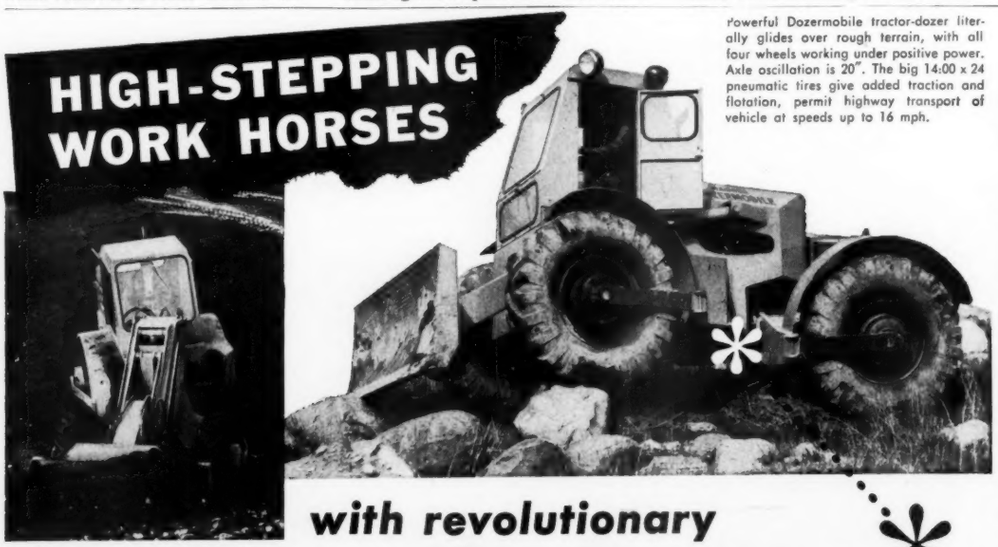
In choosing a site, Salvador V. Caro, General Manager of the Transportation Authority in consultation with the Civil Aeronautics Administration and PRTA authorities, decided on Isla Verde which is 7 miles from San Juan, but outside the city limits.

There was a heavy growth of coconut trees on the property covering about 1,300 acres of which, however, only 462 acres have been cleared. The clearing method which gave the best results was to dig alongside the palm tree with a mechanical shovel until the root was uncovered and, thrusting upward, knock down the whole palm tree. This was effective since coconut trees do not have widely extended roots. About 40,000 trees were uprooted in this manner and hauled away in dump trucks to a disposal area where they were buried.

Fill and Drainage

The contract for the fill and drain-

HIGH-STEPPING WORK HORSES



Powerful Dozermobile tractor-dozer literally glides over rough terrain, with all four wheels working under positive power. Axle oscillation is 20°. The big 14:00 x 24 pneumatic tires give added traction and flotation, permit highway transport of vehicle at speeds up to 16 mph.

Working stability on uneven ground is job-tested feature of LD 5 Scoopmobile. Hydraulically operated bucket digs effortlessly, has exceptional "break out" action for fast loading.

Pow-R-Flex twist-turn flexibility saves maneuvering time in spotting bucket for both digging and loading. Result—more work per working shift.

with revolutionary POW-R-FLEX*

TWIST, TURN FLEXIBILITY!

No stiff-legged workhorses on the job with hydraulically controlled POW-R-FLEX coupling!

This unique principle of hinging two power axle elements together allows independent oscillation of both axles with all four wheels providing positive driving power and full steering control at any degree of turn or twist.

With exclusive POW-R-FLEX twist-turn oscillating flexibility—plus the added advantages of 4-wheel planetary drive, 4-wheel power steer, and all-hydraulic operation—these rugged Scoopmobile front-end loaders and Dozermobile tractor dozers offer mobility, maneuverability, and stability that no other machine can match.

Your Mixermobile representative has complete information regarding these and other outstanding features for profitable bulk materials handling. Or he may be able to direct you to projects where you can see these versatile machines in action. It will pay you to see him soon.

MIXERMOBILE MIXERMOBILE MANUFACTURED

*Patented and patents pending

Dozermobile (Model DM 1): 8-cylinder 180 h.p. Chrysler V-8 industrial engine* — Ten speeds forward and reverse — 15" ground clearance — 18,000-lb. drawbar pull (calculated, 1st gear).

Scoopmobile (Model LD-5): 6-cylinder 114 h.p. Chrysler industrial engine*—Eight speeds forward and reverse—All hydraulic operation—Bucket discharge height, 9 ft.—Capacity, 1 cu. yd., struck.

Scoopmobile (Model LD-10): 8-cylinder 180 h.p. Chrysler industrial engine*—Ten speeds forward and reverse—All hydraulic operation—Bucket discharge height, 9 ft. 6 in.—Capacity, 1 5/8 cu. yd., struck.

*Diesel power optional at extra cost

PLUS all with

Planetary Drive

"KNUCKLE-DOWN" POWER

3 to 1 gear reduction. "Knuckle-down" power for the tough jobs. 4 planetary-geared wheel hubs reduce torque strain on axles and differential by approximately 65%, save on maintenance costs.

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CANADA—W. A. R. McGraw, Ltd., P.O. Box 335, 6 McDougall Court 10062-100 St., Edmonton, Alberta; Contractors Mach. & Equip., Ltd., 194 Barton Street East, Hamilton, Ontario; Dietrich-Collins Equipment Co., 890 S. W. Marine Drive, Vancouver, B. C.; Automotive Products Co., Ltd., 3262 Wellington Street, Montreal, Quebec; Modern Machinery, Ltd., 120-4th St., West, Quebec City, Quebec.
EXPORTERS—Columbia Exporters, Inc., 1105 S. E. Morrison St., Portland; North Pacific Corp., 1809 N. E. 40th Ave., Portland.

age work was given to Blythe Bros. Co., Charlotte, N. C., and Ralph E. Mills Co., Salem, Va., at a cost of $1,300,000. Operations began in October, 1949.

The workmen had to contend with a firm sandy soil at low elevation. For the fill they used sand from dunes at a nearby beach, taking it to the site by Euclid truck, both rear and bottom-dump, and with smaller 4 to 5-cubic-yard trucks. These carried about 1,200,000 cubic yards to the site. In addition, another 700,000 cubic yards of sand excavated from the site for fill was used to build up the low areas.

Blythe and Mills had their own trained foremen to "break in" the local laborers, but these learned so fast that when their part of the contract was completed, only one foreman of the original crew was required to supervise the finishing.

Concrete Paving

With the original fill of sand compacted, the project was ready for concrete paving. This phase of operations began in March, 1951, and was completed in July, 1952. Original specifications called for 300 working days, but there was some extension in contract time. The contract was awarded to Zequeira & Pinero, Inc., of Hato Rey, Puerto Rico, under bid of $1,600,000 for the paving and electrical duct installations.

Since this was the firm's first concrete-paving job, Xavier Zequeira, President of the company, went to the United States to buy the necessary machinery. This heavy equipment was transported by train to Philadelphia, by ship to San Juan, and then on trailers large enough to handle the big machinery to the job site.

Equipment and Crew

The principal heavy equipment used included: 2 Lorain cranes which had been acquired eight years ago and, although having been used heavily in numerous housing projects, were nevertheless in good, serviceable condition; 2 Allis-Chalmers HD-20 tractors; a Blaw-Knox concrete spreader, finisher, and batch plant; a Caterpillar No. 12 motor grader; a Hetzel joint cutting machine and forms; and a Koehring Longitudinal Finisher. Paving was done with a Koehring Twinbatch and a MultiFoote paver.

The contractor used a crew of 150 men, including engineers, masons, operators, and laborers, all of whom worked a 44-hour week. He brought in equipment specialists to train the local help. A Blaw-Knox concrete batching plant was erected and a specialist instructed the local workmen who, in only two weeks, picked up the needed technique to operate the plant.

Work Accomplished

The job called for concrete paving of a runway which was 7,800 feet long and 200 feet wide. Pavement was 13 inches thick for 800 feet at each end, with the middle section 11 inches in thickness and transverse grade of 1 per cent. The concrete specifications required a 4,000 psi concrete. The two cranes charged the bins with aggregate. These rigs with backhoe attachments were converted to dry excavation work for the sewage system, water mains, and electrical duct installations.

Two pavers, a MultiFoote and a Koehring, working on opposite sides of a 25-foot lane, place concrete in front of a Blaw-Knox spreader.

Zequeira & Pinero were awarded the bid for a 1,200-foot extension of flexible asphalt pavement for the Mayaguez Airport. This 100-day job was finished in April, 1953.

Future Plans

With the runway satisfactorily completed, the next phase of construction calls for the paving of the apron area, which necessitates surfacing 237,000 square yards (almost equal to the area covered by the taxiway and runway) using concrete 13 inches thick.

The apron will be installed in front of the terminal building, on which work has not yet started. Present plans call for the new terminal to be in operation by June of 1954, and rapid increase in air-passenger traffic through San Juan makes it urgent that the International Airport meet the completion deadline.

Original estimates were that Puerto Rico's peak air traffic of around 600,000 passengers a year would not be reached until 1960. The economic development program, however, bringing an increased number of industrial and banking executives to the island for business pur-

(Concluded on next page)

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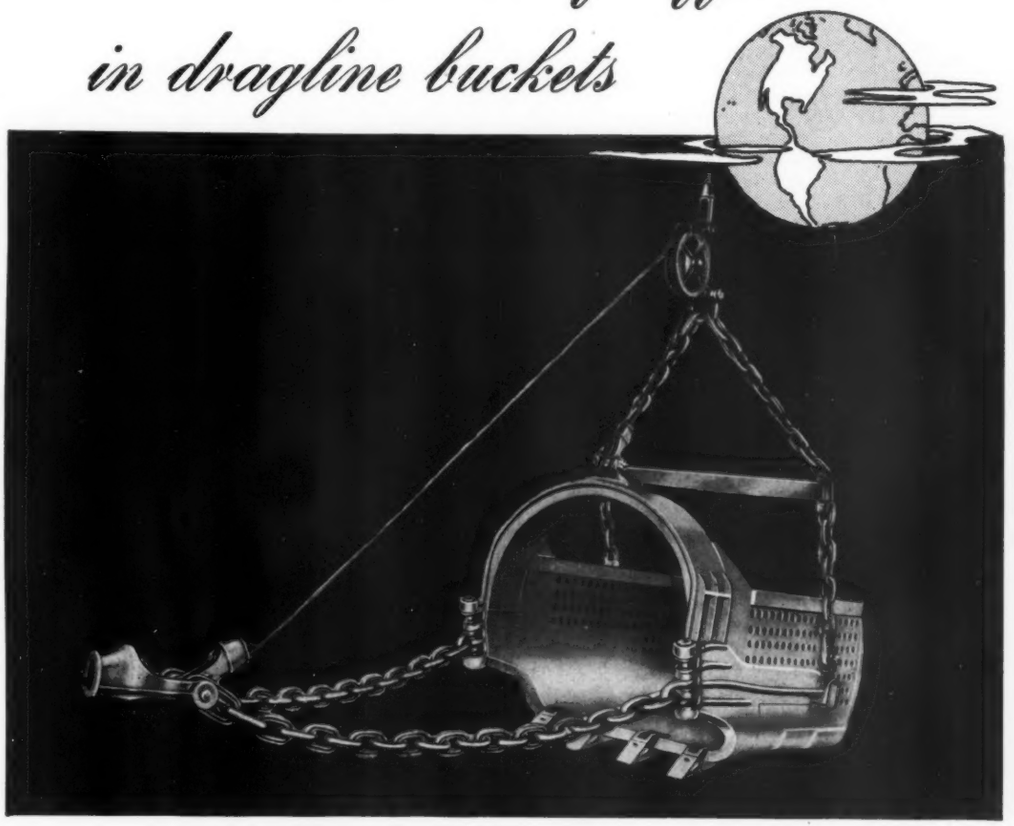

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Building an Airport For Puerto Rico

(Continued from preceding page)

poses, as well as the increased tempo of the tourist industry, have combined to change this estimate.

Air traffic in and out of the present San Juan terminal is already in excess of 500,000 passengers a year. The tourist industry in 1951-52 brought more than 90,000 visitors to the island for vacations alone, and the present prospects are that this figure will exceed 100,000 by June of this year.

Mr. Caro expects that all contracts will have been awarded and construction work completed to meet the 1954 mid-summer deadline for the complete transfer of operations from the present terminal to the international Airport site. After this has been accomplished it is anticipated that the present Isla Grande airport will revert to the U. S. Navy.

If, however, agreement can be reached between the Commonwealth of Puerto Rico and the Federal government, the Isla Grande airport site will be transferred to Puerto Rico as part of its port development program. New bulkheads and docks, warehouses, and other installations will be constructed where the old runway is now located.

Completion of the new International Airport at Isla Verde will give Puerto Rico one of the largest and most modern aviation centers in the entire Caribbean. It comprises in its entirety 1,200 acres of land less than a 15-minute drive from San Juan itself. At present only 500 acres are being allocated for aviation use, but the transportation Authority is considering plans to develop a tourist recreation area there as well. Approval of the Planning Board will be needed, however, before any such development can be started.

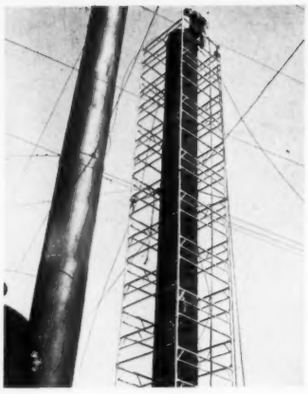
Although the entire project involves estimated cost of around $15,000,000, little more than $11,000,000 has actually been authorized and is available. The Federal-government share of $5,000,000 has been only half met, and Puerto Rico Government sources must provide at least another $3,000,000.

New Foaming Agent

A new liquid foaming agent for concrete is announced by the Mearl Mfg. Corp., 153 Waverly Place, New York, N. Y. Among the suggested applications for Mearlcrete P are low-density concrete and mortar, rigid thermal insulation, and lightweight building products.

The manufacturer states that a foamed cement paste made with this product is stable and sets to a solid foam without diminishing in volume or increasing the setting time. Varying the conditions of preparation of the foam cement will produce density, thermal conductivity and compressive strength to suit specific needs. Densities as low as 12 pounds per cubic foot are said to be readily attained. At 30 pounds per cubic foot the compressive strength of cured foamed cement is 300 psi.

For further information write to the company, or use the Request Card at page 18. Circle No. 231.



Slip-Fit Scaffolding

A new tubular steel scaffolding said to be more quickly erected and dismantled is announced by the Brainard Steel Division of Sharon Steel Corp., Warren, Ohio.

The Jagiel Kwik-Skaf scaffolding has only two basic parts: frame and tie bar. A slip-fit eliminates bolts, pins, or screws.

The scaffolding has been load-tested by independent laboratories at better than 400 pounds per square foot, according to the manufacturer. It is suited for construction projects and for use by bricklayers, masons, carpenters, and roofers.

For further information write to the company, or use the Request Card at page 18. Circle No. 216.

Stainless Steel Products

A 4-page bulletin on a line of stainless steel plates, forgings, sheets (No. 1 finish), tank heads, and flanges is offered by G. O. Carlson, Inc., 534 Marshalton Road, Thorndale, Pa.

Stainless steel rings and discs are shown as typical of the various forms, pattern-cut to shape by the company.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 269.

Pipeline-Drilling Rig

A pipeline-drilling rig that mounts on a tractor is shown in a bulletin from the Joy Mfg. Co., Henry W. Oliver Bldg., Pittsburgh 22, Pa. The Hydrojib rig consists of the company's Silver Streak rock drills, Hydro Drill Jibs, a WL-80 air compressor, air receivers, a hydraulic pump, and other equipment.

The bulletin shows how the rig is mounted. There are photographs of the unit on a variety of jobs and a sketch shows its working flexibility.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 318.

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Be sure to check lift ratings and other clear-cut measurements of "KOEHRING WORK CAPACITY" before you buy any crane or excavator. See your Koehring distributor for all the facts.

New Motor-Grader Line

A re-engineered motor-grader line is announced by Pettibone Mulliken Corp., 4700 W. Division St., Chicago, Ill. The Speed Grader is available in 65, 83, and 107.8 hp models and in two 100.2 hp units.

The grader features hydraulic controls. It has hydraulic lift cylinders and a hydraulically activated scarifier. The moldboard is of the standard pin-type and can be shifted left or right by removing one pin. Hydraulic side-shift is optional.

The circle is an alloy steel casting with the teeth on top and cast with the circle.

The unit has large front wheels, and the front and rear rims and tires are interchangeable. Power steering is standard equipment.

For further information write to the company, or use the Request Card at page 18. Circle No. 198.

Pettibone Mulliken's new Speed Grader is made in five models, including a 107.8-hp unit.

Stud Driver Guards For Anchored Parts

New guards for the powder-actuated Model 450 Remington stud driver are made to conform to the shape of conduit, structural angle, and channel iron to be fastened to steel and concrete. The guards give greater coverage of the work area and easier tool and fixture positioning. Each of these special guards can be rotated 360 degrees so that the stud driver is placed in a suitable operating position, regardless of the location of the fixture to be anchored.

Special guards are made for Unistrut and Wiremold sections; Loxit channel; electrical switch, utility and outlet boxes; and lathing channel. Custom-made guards are available for fastening other types of sections. All the special guards are interchangeable with the standard guard furnished with the stud driver.

The conduit clip guard is adjustable for use with ½-inch, ¾-inch, and 1-inch conduit, both light wall and rigid types. The clips are snapped into the guard. The stud driver is then positioned over the conduit or pipe and a stud is driven through the clip directly into the concrete or steel base material.

For further information write to the Remington Arms Co., Inc., Bridgeport, Conn., or use the Request Card at page 18. Circle No. 211.

Highway Research Reports

"Highway - Materials Surveys" (Bulletin 62) and "Distribution of Load Stresses in Highway Bridges" (Research Report 14-B) are the titles of two new booklets published by the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

The Committee on Materials Surveys was established by the Board to study the problem of obtaining suitable aggregates and granular materials for highway-construction purposes under present economic conditions. The results are discussed in "Highway-Materials Surveys", a symposium of four papers containing the latest information and developments in the field. The price of the pamphlet is $1.50.

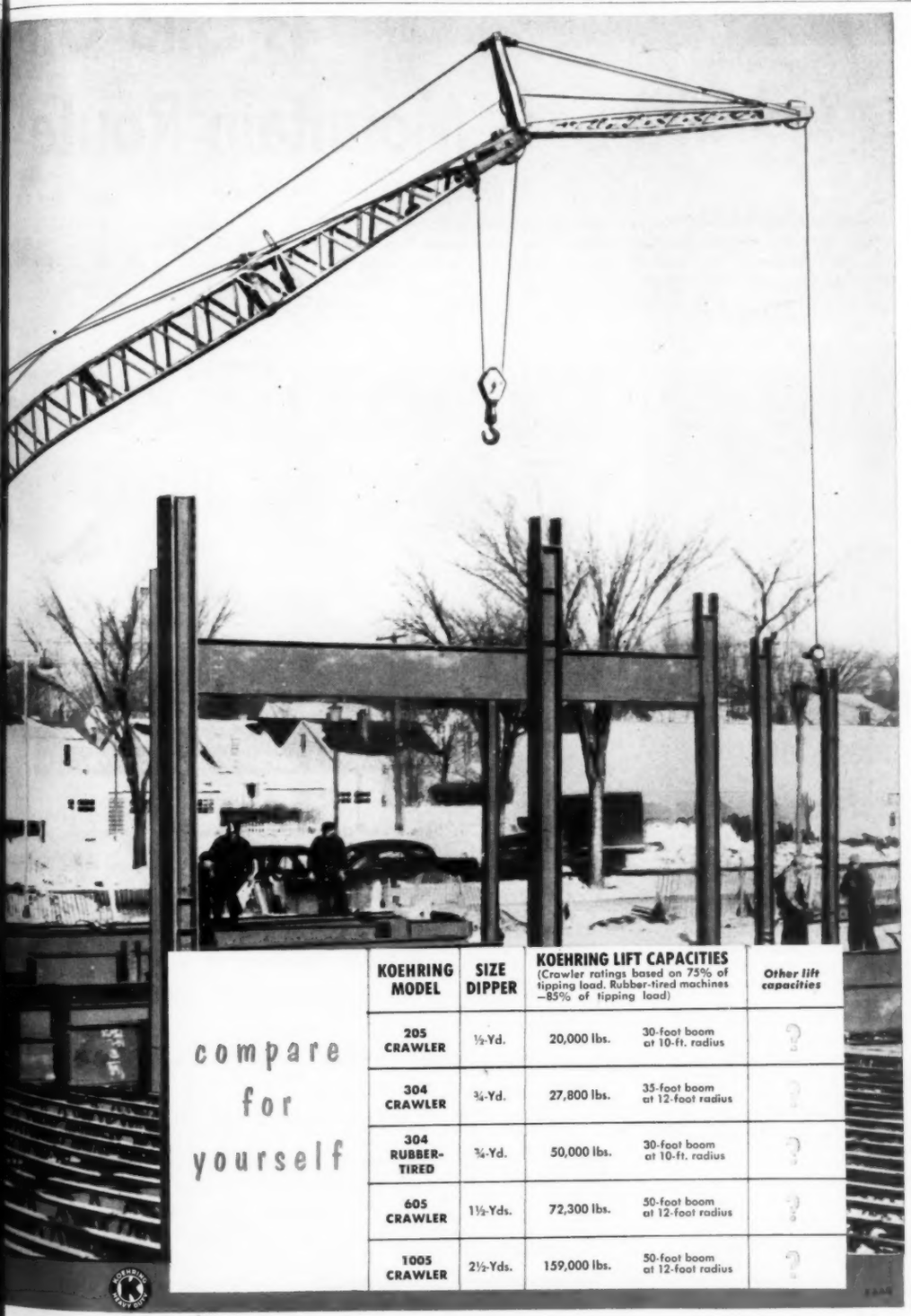
"Distribution of Load Stresses in Highway Bridges", sponsored by the Board's Committee on Bridges and presented at the Thirty-first Annual Meeting, contains six papers, discussing the distribution of loads on various types of bridges, as gathered from actual experience. The price of the booklet is $1.50.

Booklet on Jaw Crushers

A booklet on single-toggle force-feed jaw crushers is available from the Rogers Iron Works Co., Joplin, Mo. The text stresses the advantages of the single-toggle machine such as its light weight, portability, and economy of initial cost and maintenance. The company's line includes crushers with feed openings ranging from 10 x 16 to 32 x 40 inches.

Two and 4-wheeled trailer-mounted models are also shown.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 326.



KOEHRING MODEL	SIZE DIPPER	KOEHRING LIFT CAPACITIES (Crawler ratings based on 75% of tipping load. Rubber-tired machines —85% of tipping load)		Other lift capacities
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304 CRAWLER	¾-Yd.	27,800 lbs.	35-foot boom at 12-foot radius	?
304 RUBBER-TIRED	¾-Yd.	50,000 lbs.	30-foot boom at 10-ft. radius	?
605 CRAWLER	1½-Yds.	72,300 lbs.	50-foot boom at 12-foot radius	?
1005 CRAWLER	2½-Yds.	159,000 lbs.	50-foot boom at 12-foot radius	?

This Cedarapids Junior Tandem crusher made all aggregate base and also produced the hot-mix mineral filler. *Ray Day Photo*

Plant-Mix Is Laid On Mountain Route

(Photo on page 1)

• TRAFFIC bottlenecks in Arizona's spectacular Queen Creek Gorge highway between Superior and Globe, on U. S. 70, are ended.

A battle to make the gorge route safe for travelers began in the 1870's, when wagon trains banded together so their passengers could fight off the warring Apache Indians. When the automobile age came along, many a construction battle was fought to gouge a twisting, narrow path along the precipitous sides of the high dacite walls. Today, after years of engineering and construction effort, a modern 70-

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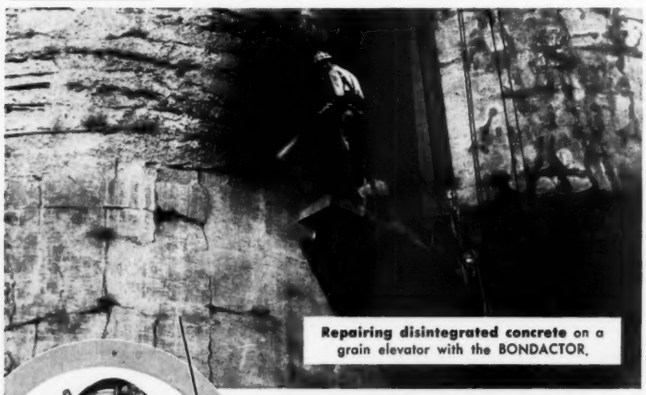
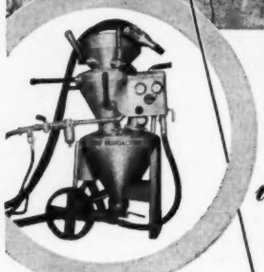


Repairing disintegrated concrete on a grain elevator with the BONDACTOR.



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Make repair and restoration of disintegrated concrete one of your most profitable operations. With the BONDACTOR you can complete such jobs faster, easier and make more money than ever before.

The BONDACTOR guns concrete and many prepared masonry and cementitious materials into the old surface so that perfect cohesion and a bonding action takes place. Bondacted repairs are generally stronger and longer-lasting than the original structure.

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Just a few of the new construction and repair jobs that the BONDACTOR does better: Concrete Wall and Roof Fabrication • Stuccoing • Waterproofing • Insulating • Fireproofing • Refractory Linings • Sandblasting.

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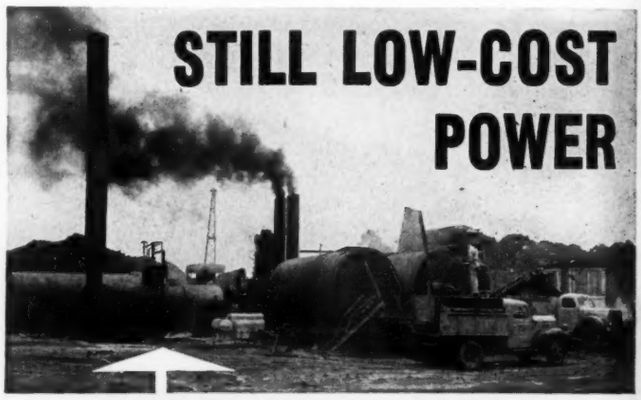

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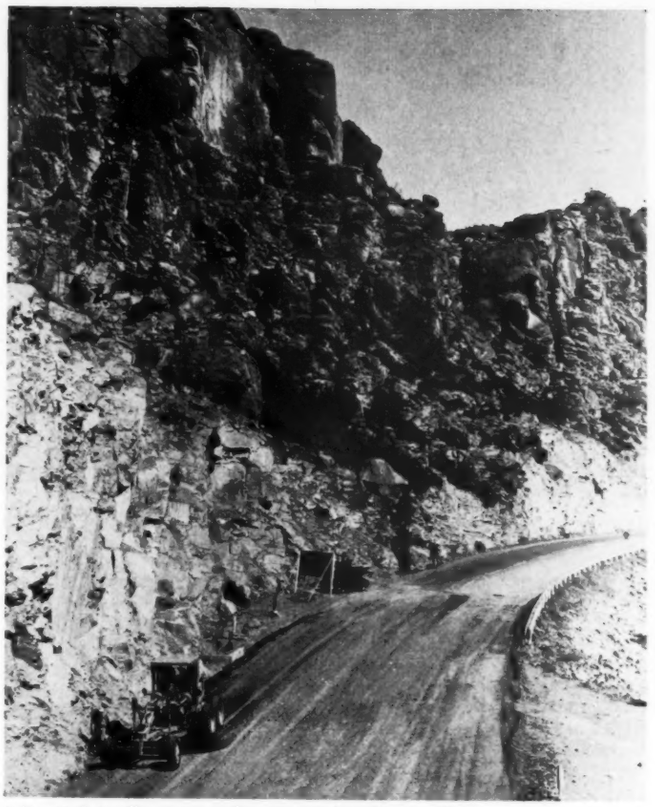
CONTRACTORS AND ENGINEERS

mph highway has been delivered. D. A. Flickinger, Phoenix contractor, put the finishing touches on 3.3 miles, centered around Superior, for a contract price of $206,425. Flickinger's job included selection of granular material, aggregate base, plant-mix surfacing, and miscellaneous items like construction of fences and guardrails. The job was somewhat noteworthy because of a paving schedule which saw hot-mix laid down through some of the 1952-53 winter months.

Paving Covers Other Jobs

In the short space of time between November 1, 1952 and April 1, 1953, Contractor Flickinger covered the same linear footage which took nearly 5 years to build. His paving contract even extended outside some of the toughest area, since it covered some highway west of Superior. But in the first 2 miles east of Superior, the location and construction of a modern roadbed was one of the most brilliant feats in Arizona road-building history.

The old highway wound up the gorge at water level for a few thousand feet, and began a series of dizzy switchbacks and tortuous 20-mph curves as it climbed up toward Claypool Tunnel. The new location begins climbing on an easy 6 per cent grade as soon as it leaves Superior. In a series of tangents and gentle curves, it cuts through solid rock walls, crosses Queen Creek on a spectacular steel arch bridge, makes a reverse curve into a new 4-lane vehicular tunnel which has the latest thing in high-intensity lighting, and continues its easy curving climb to higher country. The change which has been wrought is one from a highway which scared tourists to one they will enjoy.



A No. 12 Caterpillar motor grader gets granular subbase ready a day ahead of the paving operation. *Ray Day Photo*

Flickinger's paving covers one area where Vinnell Co. drilled and blasted through manganese seams so hard they wore out tungsten-carbide bits in 13 inches. The Queen Creek Bridge, which took nearly 2 years to build, was in the job. So was the new tunnel. Excavation battles, when it took the sun until 10 a.m. to reach the paving crew in some parts of the gorge, were still vivid memories.

The plant-mix paving will provide a riding surface 40 feet wide over the mountainous portion of the highway, and 56 feet wide in the outskirts of Superior. There is 3 inches of crushed-aggregate base course over the entire job, and from 6 to 12 inches of select granular material below that, depending on subgrade conditions.

One Pit Produces All Rock

One gravel pit 3 miles southwest of Superior in a dry wash provided all the rock necessary to do the subbase and paving work—about 55,000 tons in all. Flickinger purchased a new Cedarapids Junior Tandem rock

(Continued on next page)

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Plant-Mix Is Laid On Mountain Route

(Continued from preceding page)

plant especially for this job, and moved it in about November 10 to produce the aggregate base and mineral filler for plant-mix. Some ⅜-inch-minus chips were also crushed for the armor-seal coat.

Powered by an International UD-18 diesel engine, the Junior Tandem machine turned out a steady flow of tonnage through its screening and crusher system. The plant came equipped with a 10 x 36 jaw crusher and 20 x 30 rolls. In pit material where not more than 25 per cent had to be crushed, the plant turned out up to 200 tons an hour in aggregate base, according to owner Flickinger. Tonnage, of course, dropped off considerably when the fine ⅜-inch chips were run.

This Barber-Greene finisher is laying a 12-foot asphalt lane as it threads its way uphill through Queen Creek Gorge.

Ray Day Photo

The select material and the aggregate base were trucked to the site and dumped according to measured weights of each load. The material was then blade-mixed by a Caterpillar No. 12 motor grader, doused with moisture from a 3,200-gallon truck-mounted water tanker, and blended some more. The lifts were then laid down 3 inches thick, and compacted with the laydown process by pneumatic and steel-wheel rollers. The subbase was built up in this way until the last 3-inch lift of aggregate base was in, at which time surveyors carefully checked the base and indicated further blading and rolling where the surface was not true. The base was laid exceptionally smoothly, considering that portions were open to traffic, and the normally cold wet winter months were at hand.

The only base priming which was done was near the west Superior end of the project, where 0.35 gallon of MC-1 was applied over the subbase. In the mountain grades, the granular base was rolled down tight just ahead of the asphalt laydown operation.

One Asphalt Plant Setup, Too

The pit location largely governed the asphalt plant setup, too, and one setting was sufficient to deliver the necessary tonnage. Flickinger rented from Daley Construction Co. a Madsen 2,500-pound asphalt batch plant for this job.

Aggregates for the plant-mix were bulldozed only 150 feet or so from the Cedarapids rock plant. The mix called for only a 2-bin pull, so the two aggregate sizes were stockpiled side by side near a trap and feeder which delivered the material via conveyor belt to the dryer. A Caterpillar D8 tractor with a Caterpillar U-type dozer was used in moving the aggregates from stockpile to trap. Production control over the aggregates had been so precise during the crushing operation that very little oversize or otherwise rejectable mineral had to be kicked off when the material hit the screen system on the Madsen plant.

SC-6 asphalt, from California refineries, was furnished by American Bitumuls & Asphalt Co. through its Tucson branch office. The oil

Less strain for crane on TIMKEN® bearings

WITH a bucket capacity of ¾ cu. yd., this Unit 1020 Dragline is designed for jobs where power, speed, stability and long reach are vital. To help keep it on the go with minimum maintenance, it uses Timken® tapered roller bearings at vital points: 2 on the vertical idler gear, 2 on the vertical swing shaft, 8 on the conical rollers, 4 on the fairlead.

Timken bearings take radial and thrust loads in any combination. Line contact between their rollers and races gives them extra load-carrying capacity. Shafts and gears stay in alignment, reducing wear. The true rolling motion and incredibly smooth finish of Timken bearings practically eliminate friction.

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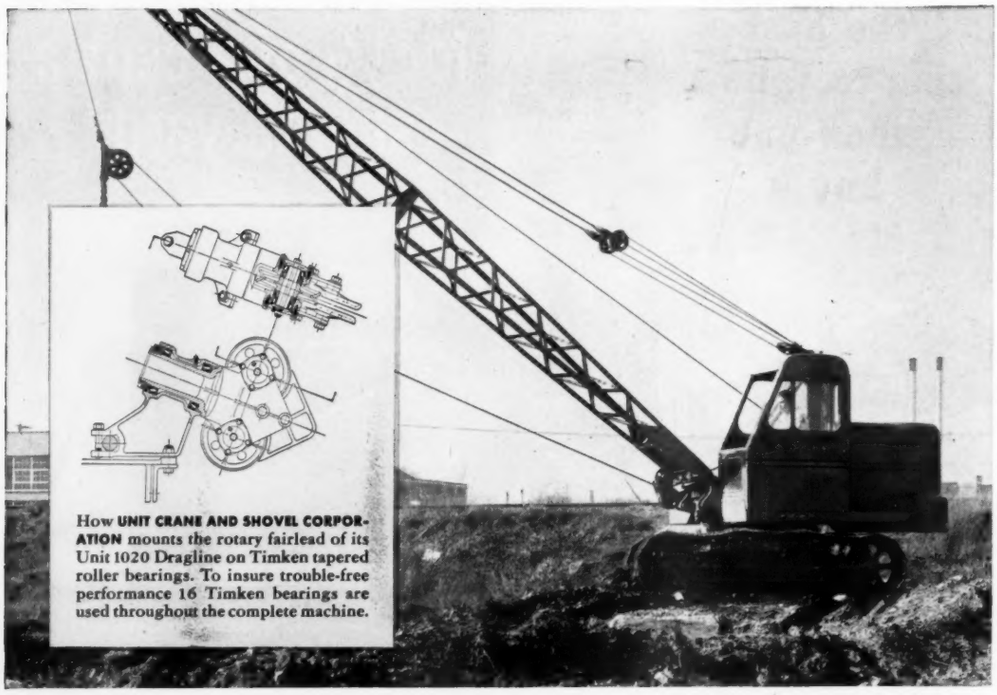
Timken bearings normally last the life of the machine. They are 1) engineered for the job, 2) made of Timken fine alloy steel, 3) precision manufactured.

Why not profit from the more than 50 years of bearing research and development of the Timken Company? Specify Timken bearings in the machinery you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

This symbol on a product means its bearings are the best.



How **UNIT CRANE AND SHOVEL CORPORATION** mounts the rotary fairlead of its Unit 1020 Dragline on Timken tapered roller bearings. To insure trouble-free performance 16 Timken bearings are used throughout the complete machine.

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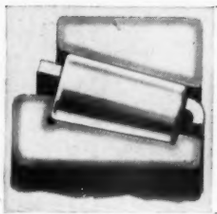
TAPERED ROLLER BEARINGS



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The Timken Company leads in: 1. advanced design; 2. precision manufacture; 3. rigid quality control; 4. special analysis Timken steels.

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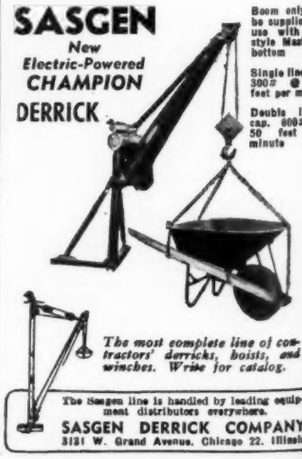

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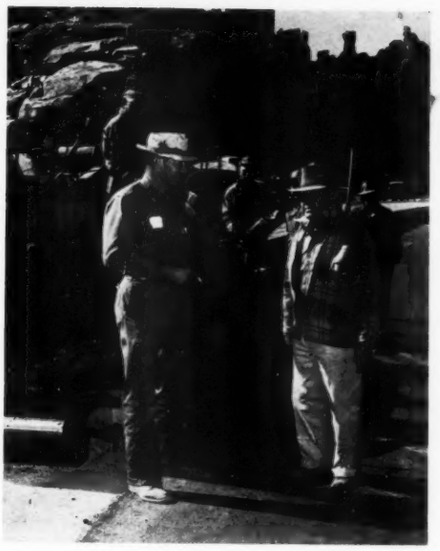

Contractor D. A. Flickinger (left) and Resident Engineer Ray Gardner, with the laydown crew in the background.
Ray Day Photo

arrived via railroad tank cars at a siding in Mesa, about 60 miles from the job, where the cars were brought up to pumping temperature by a Grace retort. The SC-6 was then trucked out to the plant and pumped into a pair of 6,200-gallon horizontal storage tanks set near the pugmill part of the plant. A 3-inch Viking pump handled the material from that point.

The two materials—aggregate and asphalt — followed a conventional route in passing from storage to the truck beds as a mixed product. Aggregate dropped through a trap to a 24-inch conveyor belt, which dropped it into a 48-inch x 20-foot dryer. Ejected from the dryer at a temperature of 285 degrees, the rock was scooped up by a high hot elevator and dumped to the 20-yard aggregate bins after being screened by a double-level vibrating system. From the hoppers, it was weighed, and dropped into the Madsen-built pugmill.

Moving in a continuous loop, the asphalt left the storage tanks, moved up to an electrically-heated hot pot, and enough for each batch was drawn off and weighed. The asphalt then went to the pugmill for its share of the mixing.

The Madsen plant was formerly a stationary setup owned by W. E. Hall before it was purchased and made mobile by Daley. While the plant is an older model, modern features have been put on, such as electric dustproof motors driving the hot elevator and screens. A new Caterpillar D13000 diesel drove the pugmill, a Caterpillar D311 was assigned to the dryer, and a 100-kw Murphy diesel-electric set furnished electric power. A 100-hp Davey boiler, fired by Grade SP-300 fuel, heated the asphalt tanks, operated the pugmill rams, and furnished steam to atomize fuel at the dryer burner. A new Ingersoll-Rand 600-cfm Gyro-Flo compressor worked at the setup to make it much more efficient by atomizing the boiler fuel and furnishing an air blast at the dryer burner to sweep the dust away from the burner. This air jet increased the dryer capacity by an estimated 20 per cent. Fortunately the pit was on the dry side—about 5 per cent moisture—so the dryer worked well.

Each 2,500-pound batch consisted of 1,200 pounds of sand, 1,200 pounds of 1-inch-minus aggregate filler, and 100 pounds of SC-6 asphalt. Asphalt content was figured on the basis of 4½ per cent.

The plant turned out tonnages up to a 100-ton-per-hour maximum in an 8-hour run. Plant-mix was dumped to a fleet of 8 waiting batch trucks, which were rented on a per-hour basis. Each truck was equipped to haul 8 batches, but the loads were weighed to stay within Arizona loading limits and ordinarily not more than 10 tons per load went out per trip. The longest haul distance from the plant to the extreme end of the project was 6 miles. Even on this haul, the weather was sufficiently summer-like all winter long so that the loads did not have to be covered. The mix left the plant at an average temperature of 275 degrees, and arrived at the laydown machine at 250 to 255 degrees.

Laydown Moves Fast

The highway width was such that 10 and 11-foot lanes could be laid

(Concluded on next page)

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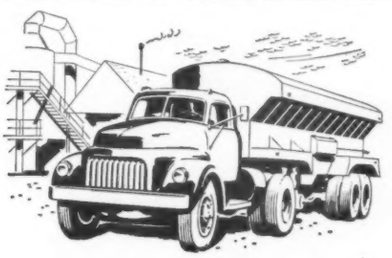

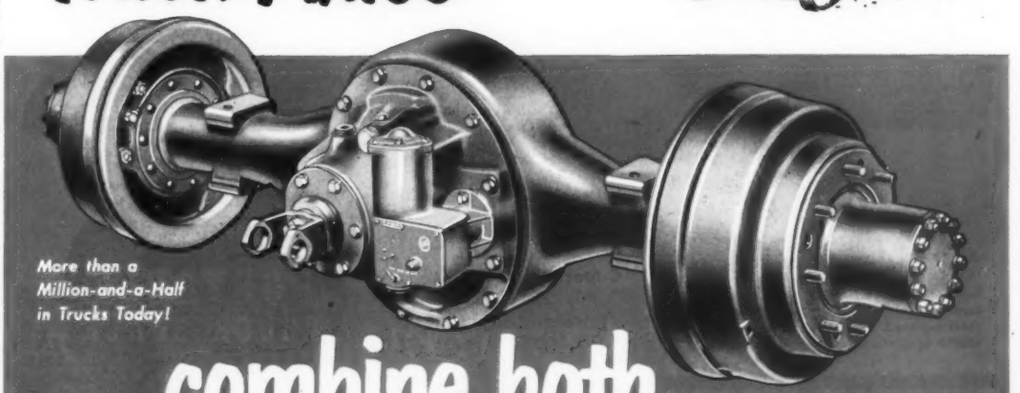

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Plant-Mix Is Laid On Mountain Route

(Continued from preceding page)

by the street gang, so progress was good. Flickinger then rented a Barber-Greene finisher from Contractor Ernie Mohamed in Phoenix, and used it to lay the plant-mix. The mountain grades were laid uphill, so that the batch trucks would not have a tendency to pull away from the laydown machine. Also, uphill rolling seemed to work out better and there was less surface checking, especially if the roller operator got up too close to the paving crew.

The paving crew was composed of a laydown machine operator, screed man, 2 rakers, 2 laborers, a roller man, and a foreman. The various lanes were laid in conventional manner, starting the first against a string line and laying succeeding lanes to meet the previous edge. Edges were tightened by crowding the machine slightly, and a knockdown roll by a Galion 10-ton tandem steel wheel delivered longitudinal joints practically invisible after the traffic had used the pavement for a few days.

The plant-mix was laid in a 2-inch-thick compacted cake in one pass. It was impossible to pave one lane completely through the project, so small sections were readied at a time and paving was then laid. When CONTRACTORS AND ENGINEERS visited the project, for example, a 900-foot stretch was being laid from the east end downhill almost to the new tunnel.

Flickinger had a peculiar traffic-handling problem for about 150 feet east of the new vehicular tunnel, where a short subgrade plug and granular base will have to be built to hook the highway on to the tunnel. While most of the job was being paved, traffic used the old road beneath a temporary wooden bridge, built by Fisher Contracting Co. when it excavated the tunnel. Flickinger's batch trucks and other vehicles used the new road coming up the mountain, passed through the tunnel, and crossed the temporary bridge to go on to the east end of the job. While the wooden bridge was torn out and the embankment built at that point, a flagman had to be used to control 1-way traffic up a short ramp close against the mountain. As soon as the short plug was in, this access ramp was torn out.

The installation of high-intensity lights in the new tunnel now appears to be the controlling factor deciding when the new road will be open. Summer tourists using U. S. 60 and 70 are virtually certain to have access to the new highway.

Rocky Guardrail Settings

Mute evidence of the terrific battle in rock fought by previous contractors was visible to the last, as Flickinger's crews tussled with granite and dacite rock to set creosoted guard posts to hold the steel guardrails. A small Le Roi air compressor, Jeep drawn, operated a 55-pound Thor jackhammer. In many of the post locations, it was necessary to drill a 2-inch hole full depth, load it heavily with stick powder, and then bail the broken rock out with a spoon-type shovel. Practically the entire length of precipitous edges will be protected by the guardrail system.

Personnel

Flickinger's forces were under the personal supervision of D. A. Flickinger, assisted by John Carey. State crews worked under Resident Engineer Ray Gardner. R. C. Perkins is Arizona's State Highway Engineer, and C. B. Browning is Construction Engineer.

DID YOU SAY **PORTABLE?**

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Insulating Mat Has Glass Fiber Center

A new glass fiber insulating mat is reinforced with parallel strands of glass yarn and coated with waterproof asphaltic materials.

Duramat may be used as a vapor barrier under basementless buildings and in refrigerated rooms; a covering and weather sealing for above-ground insulated pipes and exposed ducts; and a lining for irrigation ditches, laterals, canals, farm stock ponds, reservoirs, and swimming pools. It will not rot or deteriorate.

No special skill and a minimum of equipment is needed to install the material. It can be cut with a sharp linoleum or roofing knife and sealed with a rapid-sealing asphaltic cement.

The glass-fiber mat is available in two thicknesses. Type 252 weighs 51.8 pounds per 108 square feet and comes in rolls of 36 inches by 36 feet. Type 251 weighs 23.5 pounds per 108 square feet and comes in rolls 36 inches by 72 feet. The surface is dusted with mica to prevent sticking in the roll.

For further information write to Glass Fibers, Inc., 1810 Madison Ave., Toledo, Ohio, or use the Request Card at page 18. Circle No. 258.

PAYS OFF WITH BIGGER PAYLOADS

3 MODELS 3-4½-5½ Yds.

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- Easier to handle on the road and on the job.
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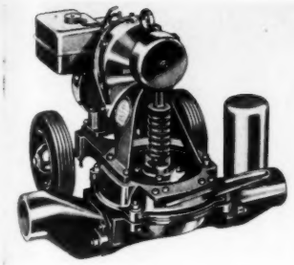


New Diaphragm Pump

A new diaphragm pump delivers 50 gallons of water per minute at 25 feet suction lift. On a diaphragm life test, the pump has operated more than 450 hours without diaphragm failure, according to the manufacturer. New design features include a suction accumulator and spring cushioning the downstroke of the diaphragm connecting rod. Powered by a Briggs & Stratton 2½-hp engine the pump is driven through hardened steel gears running in oil, in an enclosed case.

With suction and discharge fittings detached, the unit weighs 130 pounds. Overall weight is 153 pounds.

For further information write to the Gorman-Rupp Co., 305 Bowman St., Mansfield, Ohio, or use the Request Card at page 18. Circle No. 244.

Line of Magnetos Described

A booklet on magnetos is available from Fairbanks, Morse & Co., Magneto Division, Beloit, Wis. Magnetos shown are for 1, 2, and 4-cylinder engines. Special magnetos for Wisconsin engines are also illustrated.

The centerfold has photographs of a variety of uses for the magnetos. Magnetos for special applications are also pictured in the catalog and include units with vertical and inverted mountings and a flywheel magneto.

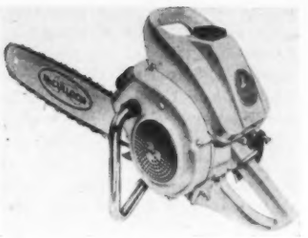
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 321.

One-Man Chain Saw

A new one-man chain saw is introduced by McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif. The Model 4-30 is said to cut through timber up to 5 feet in diameter. It is also recommended by the manufacturer for cut-off work in any position, pruning, land clearing, timber ripping, and general woodcutting.

The saw weighs 30 pounds complete with a 14-inch chrome-plated blade and chain. Blades available range up to 36 inches in length.

A 15-inch bow attachment is also made. The saw is said to operate in all positions, without carburetor adjustment. Other features of the saw are automatic clutch, automatic-rewind starter, large fuel capacity, chain oiler, the Sabertooth chain,



and grouped engine controls.

For further information write to the company, or use the Request Card at page 18. Circle No. 192.

Stainless Steel Fronts

A new 40-page booklet on stainless steels for store fronts and building entrances has been issued by the Committee of Stainless Steel Producers, American Iron & Steel Institute, 350 5th Ave., New York, N. Y.

Detail drawings, photographs, and brief comments point out significant features of installations. Construction methods cited ranged from the least expensive to high quality.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 309.

Creed Joins Superior

Jim Creed is to be Field Representative for Superior Scaffolding Co., Culver City, Calif. He will sell Superior scaffold equipment to general contractors in the West Coast

Before joining Superior, Mr. Creed served in the Marine Corps for seven years. Previously he had headed the equipment maintenance division of a midwest engineering construction firm.

4-Cycle Air-Cooled

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Power for garden tractors, mowers, pumps, sprayers, snow removal equipment, elevators and hoists, portable saws, concrete mixers, compressors, grinders, industrial and lift trucks, and a wide range of tools and equipment for industry, construction, farm and home.

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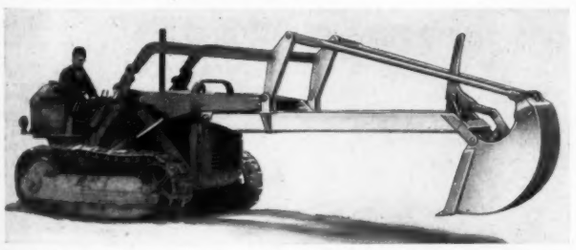
HEAVY-DUTY TRENCHER

WITH NEW IMPROVED SELF-CLEANING BUCKET — Capacity ½ yd.

A heavy-duty trench digger, which is designed for a wide variety of trenching for any highlift tractor with hydraulic bucket control.

It will increase the tractor's production from 30 to 50 per cent and is easily attached by one man in 15 minutes.



The Whitestown Trencher is now available for use on the following hydraulic controlled tractors:
Allis-Chalmers HD-5G equipped with TS-5 tractor-shovel
Caterpillar D-4 and Trackson HT-4; Oliver with 4-A Lull loader
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International TD-6, TD-9 & TD-14-A with Hough bulldozer-shovel
Hough Model HM & HR Payloader; Trojan Loadster, Models LM-75; LC-100-B
International TD-9 with Ateco Loader; Pettibone-Mulliken Model 15-D Speedall

The Whitestown trencher is equipped with a ½-yard standard bucket. Special buckets, made to individual specifications, may be obtained. It will dig to a depth of 8 feet and dump at a height of 12 feet. This trencher has been in constant use for four years, and has proved to be rugged and satisfactory in every way.

• Immediate delivery can be made.

• Please specify make of tractor.

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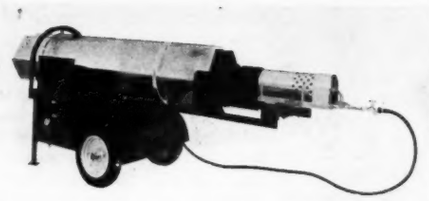
Repairing Worn Threads

Worn or damaged threads on machined, molded, forged, or cast machinery parts can be repaired with screw thread inserts made by the Heli-Coil Corp., 1184 Shelter Rock Lane, Danbury, Conn. A booklet issued by the company explains how the stainless-steel helical-wire inserts can be used in machinery-salvage applications. The damaged thread is drilled out and the hole is retapped with a Heli-Coil tap of the proper size. The insert is then set in place.

To obtain this literature write to the company, requesting Bulletin No. 348, or use the Request Card at page 18. Circle No. 323.



The Model AD-6-P Flash Flame aggregate dryer can be towed at speeds up to 15 miles per hour or carried on a pick-up for long distances.

Material Dryer Line Gets Improved Model

An improved model in its line of aggregate and material dryers is announced by the Tarrant Mfg. Co., 27-29 Jumel St., Saratoga Springs, N. Y. Among changes in the new model is a remounted and relocated large drum-sprocket. A new fuel pressure gage has been installed in the fuel line of all automatic fuel-pump models. Material deflectors have been added at the sides of the discharge end of the drying drum.

The Tarco Model AD-6 Flash Flame dryer consists of drying drum, engine, and torch and fuel equipment. Its weight is supported by two pneumatic tires and two retractable legs. Coil-type kerosene burners with windshields are furnished in various sizes.

Capacity is listed as 5 to 8 tons per hour of heated sand, or 10 to 15 tons per hour of hot stone.

An air-cooled back-geared gasoline engine supplies power to rotate the drying drum, to tumble the material, and to drive the automatic fuel pump. This engine is enclosed in a metal weather-proofed compartment provided with a padlock. Where current is available the company offers 110 volt single-phase or 220-volt 3-phase motors.

For further information write to the company, or use the Request Card at page 18. Circle No. 274.

Blacktop Paver Has Fluid-Level Device

A fluid-level device on the Adnun blacktop paver indicates the position of the screed at any time. The level makes for more accurate spreading and a more even layer of material. This tends to give more uniform densities.

When used in leveling up old roads, the device helps to correct slopes. It gives the operator a check and control of the center of the road level. Dips, which do not show up under a straight edge, can be detected.

The device consists of two upright tubes, one mounted on each end of the screed frame. The tops of these tubes have reading glasses with removable indicators and gages. The whole tubing system is filled with liquid. Since liquid tends to seek a level, the level of the liquid in the gage glass changes in relation to the gage markings, when the screed is lowered or raised at either end.

Movable indicators can be set to indicate the lift or pitch of the screed, and adjustments can be made to hold the desired screed level.

For further information write to the Foote Co., Inc., 1916 State St., Nunda, N. Y., or use the Request Card at page 18. Circle No. 272.

Aluminum Scaffolding

Aluminum sectional scaffolding is described and illustrated in a folder from the Patent Scaffolding Co., 38-21 12th St., Long Island City 1, N. Y. The folder contains information about both ladder and rolling-type sections. Pictures of on-the-job applications, illustrations of some of the structures possible with the various sections, and specifications are given.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 238.

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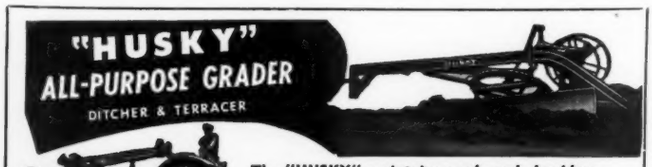
DITCHER & TERRACER



The "HUSKY" maintains roads and shoulders better at half the cost.

Finishes slopes and ditches better and faster. One man hydraulic job recommended for contractors. Guaranteed against breakage first year. Three sizes $540 to $1570. Will save you a lot of money.

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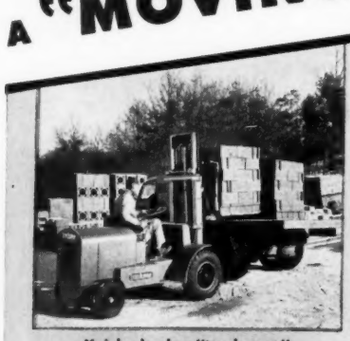
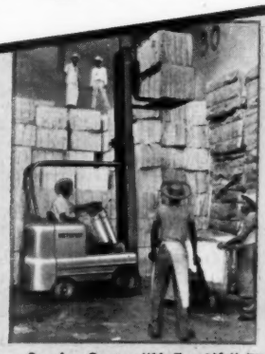
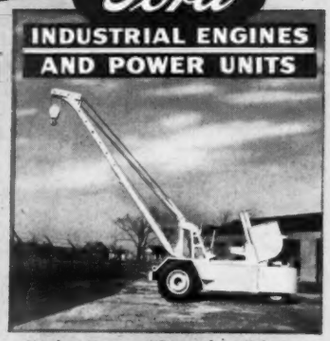


Knickerbocker "truck-man"



Service Caster "MoTowLift"



Hughes-Keenan "Roustabout" Crane

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Lessman Power Shovel

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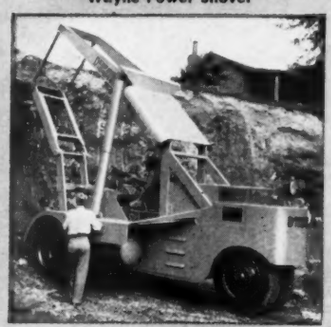
Here's proof that Ford Industrial Power takes many a load "off your mind"

"TRANSO" Load Master



Dempster DIGGSTER

Mention any type of material . . . steel, stone, lumber, concrete blocks, rubber . . . almost anything that is bulky and has to be moved, piled or handled. The list is almost endless . . . and so are the applications of low-cost Ford Industrial Power to these needs.

Ford Heavy Duty Industrial Engines and Power Units comprise 6 Great Series, ranging from 134 cu. in. to 317 cu. in. displacement. With the Right Features, the Right Power, the Right Service to offer, it will pay you to *specify* FORD!

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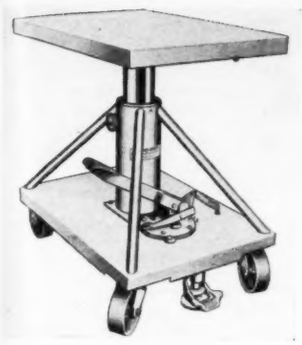

Utility Table Rises On Hydraulic Center

A new 1-ton capacity, hydraulic utility table has a 24 x 35-inch work top that rotates 360 degrees and can be raised or lowered in locked or unlocked position. The top is made of reinforced steel plate. A 2-speed foot pump on the Rack table permits faster raising of lighter loads.

The base of the table measures 24 x 35 inches. It has a lowered height of 28 inches and an elevated height of 44 inches. Four tubular trusses are welded to the center column. Other models are available in 2 and 3-ton capacities.

For further information write to the Rack Hydraulic Equipment Corp., Connellsville, Pa., or use the Request Card at page 18. Circle No. 210.

Diesel-Powered Units

Euclid earth-moving equipment powered by General Motors two-cycle diesel engines is shown in a new catalog. The booklet covers heavy-duty trucks of 10 to 34-ton capacity, bottom dumps, scrapers, and loaders. Illustrations of the various engine models and cutaway views of the Allison torque converter and torquematic transmission are also included. Featured for the first time is equipment now powered by the General Motors 275-hp 6-110 diesel engine.

The catalog contains a complete list of the company's distributors and branches and an extensive listing of GM diesel engine servicing points.

To obtain this literature write to the Euclid Road Machinery Co., 1361 Chardon Road, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 268.

Wrap-Around Insulation

An eight-page booklet describing a new wrap-around insulation for hot or cold pipes of all sizes has been announced by Owens-Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio.

Aerowrap is a gray flexible blanket-type insulation that may be applied in any thickness by wrapping on layers until the desired thickness is reached. It can be used on valves, fittings, and irregular pipes as well as straight pipe for temperatures ranging from sub-zero to 600 degrees F.

The booklet includes thickness recommendations and application data.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 201.

Three Engineers Celebrate Twenty-Fifth Anniversary

Three staff members of the American Institute of Steel Construction, Inc., 101 Park Ave., New York 17, N. Y., have completed 25 years of service with the Institute.

Chief Engineer Jack Singleton joined the staff as District Engineer, Topeka, Kans. He served in the Corps of Engineers, U. S. Army, during World War I and II, afterwards returning to the Institute. A lecturer and consulting engineer, Mr. Singleton is the author of designing manuals and articles.

Ernest N. Adams, District Engineer for the New England territory and upper New York State with headquarters in Worcester, Mass., began his career in Worcester as Chief Engineer for Norcross Bros. Co. He is District Vice President and Director of the American Welding Society.

Henry Penn, District Engineer with offices in Chicago, Ill., handles a territory including northern Illinois and northwestern Indiana. He was at one time Professor of Civil Engineering at Armour Institute of Technology.

ROAD BUILDERS—IT'S SENSATIONAL

STEEL WIRE **BIG PECKERWOOD** DRAG BROOMS

IT'S FRAMELESS TRADE MARK REG. NO FRAME REQUIRED

6 INCHES WIDE AND ANY LENGTH TO 12 FEET
NAME YOUR LENGTH — ASSEMBLE YOUR OWN
IN ANY SHAPE WANTED — IN MINUTES — NOT HOURS

MADE WITH KILN DRIED 6" WIDE HARDWOOD AND HEAVY GAUGE SPRING STEEL WIRES TRIPLE WIRES OUT EACH HOLE

ILLUSTRATION OF 12-FOOT SECTION

ONLY $3.50 RUNNING FOOT

THE TOUGHEST WIRE DRAG BROOMS EVER BUILT

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LITTLE PECKERWOOD
STANDARD UNIT SIZE
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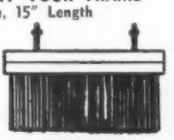
with 2 Bolts. Double Wires Out Each Hole.



OUR DRAGS NOT STAPLE SET. BOTH STOCK ITEMS.

NOW $2.50 EA.

PRICES F.O.B. K.C., MO.

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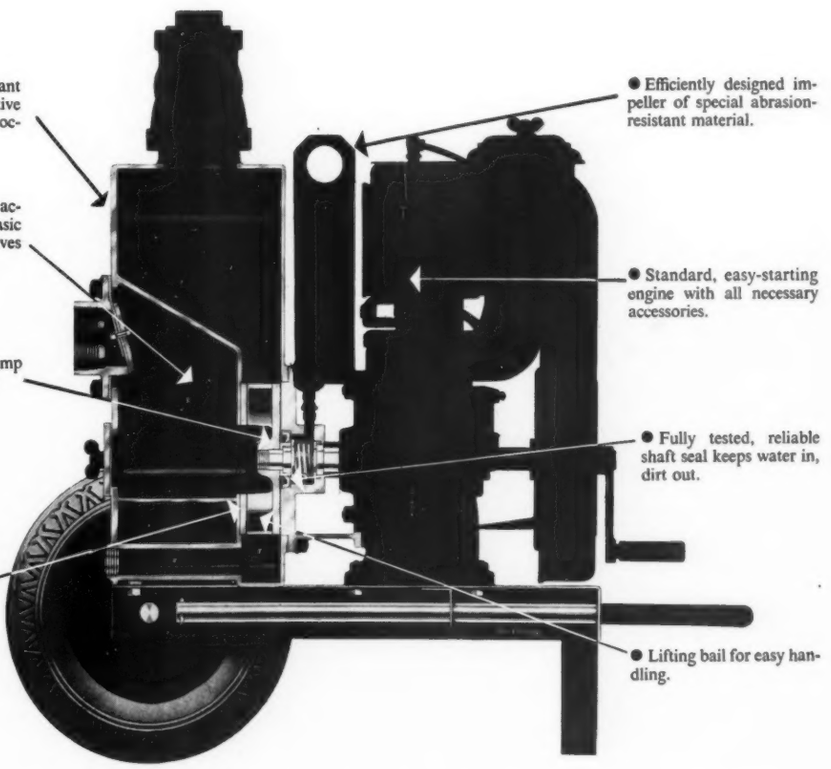
Here's the simplest, sturdiest pump a contractor can use

It's the Worthington BLUE BRUTE Self-priming Centrifugal Pump


● Light weight, rust-resistant steel casing permits effective field repair if job damage occurs.
● Self-priming operation accomplished by correct basic hydraulic design. No valves or parts to clog.
● Only two moving pump parts—seal and impeller.
● Renewable and reversible impeller wear plate doubles impeller life.
● Efficiently designed impeller of special abrasion-resistant material.
● Standard, easy-starting engine with all necessary accessories.
● Fully tested, reliable shaft seal keeps water in, dirt out.
● Lifting bail for easy handling.

MINIMUM MAINTENANCE!

Every feature pointed out above was designed into this pump to reduce maintenance requirements to the bare minimum. Over a hundred years of Worthington pump building experience assure you that the Blue Brute is the finest pump you can buy.

It'll pay you to find out more about the Blue Brutes. Ask your nearest Worthington distributor for Bulletin W-2010-B20. Or write to Worthington Corporation, Construction Equipment Division, Plainfield, N. J. H.3.4

WORTHINGTON

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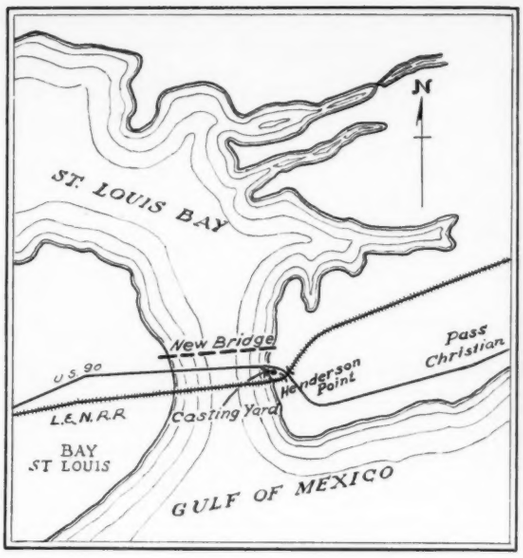
ROCK DRILLS • WAGON DRILLS • COMPRESSORS • CONCRETE MIXERS • PORTABLE PUMPS

Deck Slabs for Trestle Precast on Shore And Floated Into Place

By WILLIAM H. QUIRK, Editor



• ONE of the largest construction projects now under way along the Gulf Coast is the new Bay St. Louis bridge which Merritt-Chapman & Scott Corp., of New York City, is building for the Mississippi State Highway Department. Work on the 2-mile bridge started in the fall of 1951 and is scheduled for completion this summer. M-C&S submitted a low bid of $6,061,434 for the toll project, a figure that was 6 per cent under the next lowest bid, and nearly $2,000,000 below the high bid. Bonds sold to finance the bridge construction are expected to be retired by tolls collected at the rate of 25 cents per passenger car (no charge for passengers), with higher rates for trucks and buses. It is estimated that the bonds will be retired within 20 years.

St. Louis Bay, a wide, shallow body of water emptying into the Gulf of Mexico, is now spanned at its mouth by a narrow, two-lane, creosoted-pile, timber trestle with a drawbridge at the boat channel. The structure carries U. S. 90, the Old Spanish Trail, between the towns of Henderson Point on the east and Bay St. Louis on the west. On the completion of the new bridge, the old span will be removed under the construction contract.

Land approaches to the new bridge are under a separate contract. From the west end of the bridge it is 60 miles to New Orleans, La. From Henderson Point on the other side, it is 3 miles east to Pass Christian, Miss.

Located about 2,000 feet north of the original timber trestle, the new structure is also a low-level crossing but built of concrete and steel. It is designed for H20 S16-44 loading, and features a 124-foot steel double-leaf bascule span at the channel, providing 100-foot horizontal clearance. Flanking the bascule on each side are 75-foot steel approach spans. The rest of the bridge consists of 239 reinforced-concrete girder trestle spans, each 41 feet long, on concrete pile bents. Of the 239 trestle spans, 103 are on the east or Henderson Point side, while the remaining 136 spans are west of the bascule on the Bay St. Louis side. Total length of the project is 10,198 feet.

Four-Lane Roadway

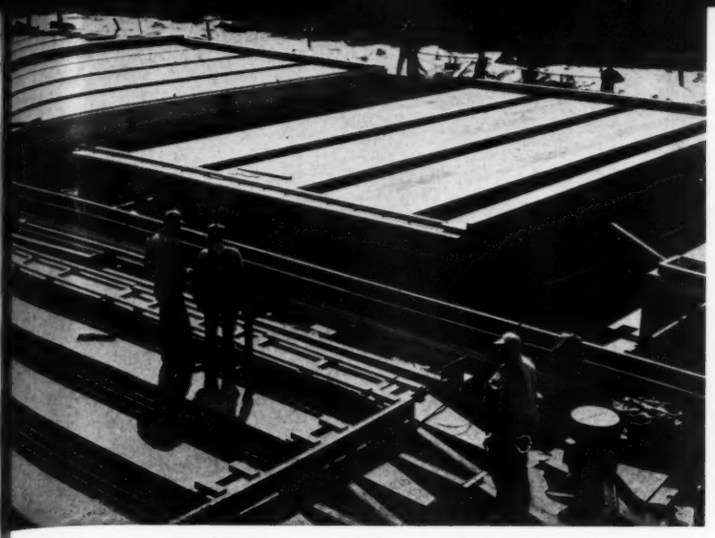
While the bay is shallow, the bottom is soft, and piles from 40 to 98 feet in length are required in the trestle. Piles are of precast reinforced concrete, 24 inches square, and are driven 8 to the bent on 8-foot centers. The 4 piles at the center are plumb, while the 2 outside piles on each side are battered in 1 to 12. Every seventh bent is a tower bent containing 16 piles battered both ways. Piles are embedded one foot into the cast-in-place caps which are 61 feet 2 inches long by 2 feet 6 inches deep. At the standard bents, caps are 3 feet 6 inches wide while at the tower bents they are 6 feet wide. Because of the unforeseen extremely soft bottom in one part of the bay, 73-pound H-beams, 135 to 180 feet long, were driven as piles in 24 bents in order to get the required bearing. The top 30 feet of these steel piles were incased in concrete.

Across the caps go the RC girder slabs which are precast in half-width sections, 41 feet long by 27½ feet wide. Each span in place has eight girders, 3 feet 6 inches deep by 1 foot 7 inches wide, on 8-foot centers and supporting a 7½-inch deck slab. Spans have fixed supports at one end, and expansion rockers at the other. The deck has two 26-foot roadways that are separated by a 3-foot raised concrete median strip. Along each side are cantilevered 4-foot ½-inch cast-in-place sidewalks. Total width of the bridge is 63 feet 1 inch.

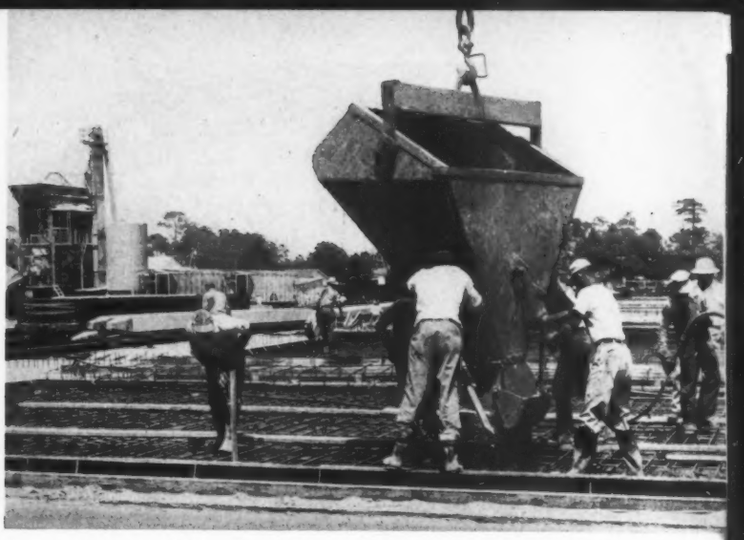
Site for Casting Yard

Since the contractor planned to precast piles and deck slabs and float them to the bridge site, his first step was the selection and preparation of a site for a yard in which to cast 2,456 piles and 478 half-roadway-width deck slabs. A tract of land was obtained with a 200-foot front along the east side of the bay near its mouth, and extending inland for over 1,000 feet and widening out to over 300 feet. It is located between two bridgeheads—the existing highway structure to the north, and

The casting yard fronting the bay. Next to the L & N tracks at the left is the 50-foot-span gantry straddling the deck slabs. Riding on 30-foot-gage rails is a Wiley Whirley astride the pile area. To the right is the batching and mixing plant. Spur tracks were laid into the yard for delivery of materials by rail.



Pile forms for casting alternate rows are in the foreground. To the rear are half-slab deck forms. Blaw-Knox ⅜-inch steel forms are used for all concrete pours.



Placing the concrete in slab form from an Insley bucket. The batching and mixing plant is in the background on the left.

the bay crossing trestle of the Louisville and Nashville Railroad adjoining on the south.

This site was a swamp, however, and before it could be put to use the area had to be cleared and filled in. The Sloat Dredging Co. of Slidell, La., with a 16-inch hydraulic pipeline dredge, pumped 15,000 yards of material up on shore to bring the low marshland to a suitable grade. Fill was obtained by digging out slips for mooring barges along the shore line. Since the bay has a depth of from about 2 to 8½ feet, a channel was dredged out to the draw span of the existing highway bridge. A 9-foot channel was also dredged along the alignment of the new bridge to provide flotation for the water-borne equipment and the barges carrying the precast members. This channel dredging involved about 250,000 yards, and white sand from the bay bottom was pumped up along the western shore to form a fine beach just north of Bay St. Louis.

In addition to the stabilizing fill pumped over the marshy site for the casting yard, the contractor drove 1,200 timber piles, 35 feet long, to provide a solid foundation for his land operations. A crawler crane, working on mats, drove the piles. A concrete slab was then poured over the piles to serve as a work mat and bed for the casting areas.

Well Planned Layout

Tracks totaling nearly 3,000 linear feet were laid into the yard from the L & N Railroad. One spur at the north end branches out into two lines serving the concrete batching and mixing plant; cars with aggregate come in on the upper, and bulk cement arrives on the lower track. The American Sand & Gravel Co., of Hattiesburg, Miss., supplies the fine and coarse aggregate. A Bay City 25-ton truck crane, equipped with a 65-foot boom and a ¾-yard clamshell bucket, unloads the cars and either stockpiles the material or charges the Erie plant. The 4-compartment bins have a 118-ton capacity. Lone Star air-entrained cement is unloaded with worm gear and a 48-foot-high enclosed elevator, and stored in the Erie silo and bin.

On a platform below the bins in the plant tower is a Worthington-Ransome 34-S dual-drum mixer that discharges either into a Rex Pumpcrete machine, concrete buckets, or Maxon Dumpcrete trucks, depending on the type of pour being made. Water for the mix comes from an 800-foot artesian well.

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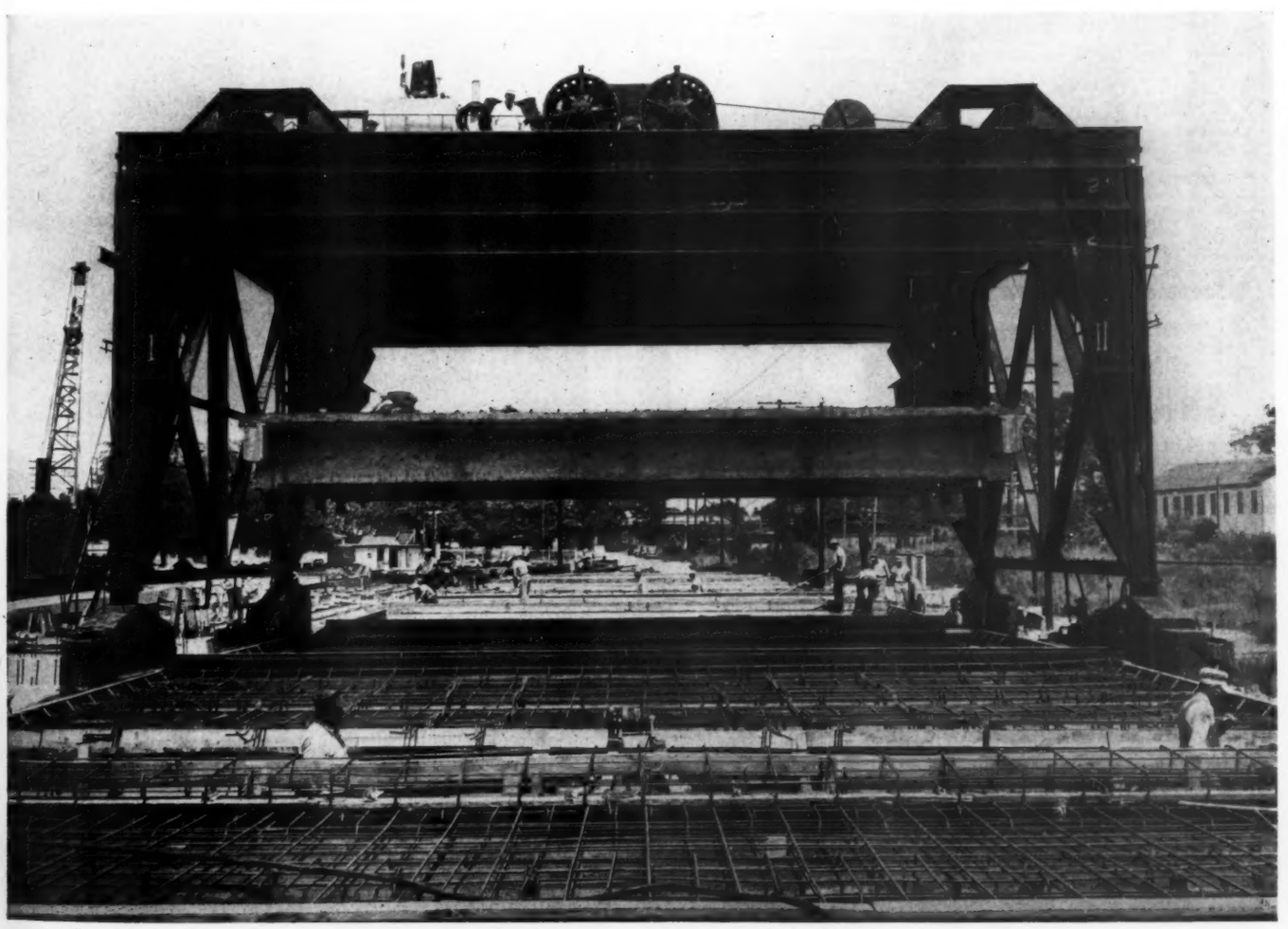

This big gantry with a 50-foot span picks up a 41 x 27½-foot precast slab weighing 122 tons, and moves it down to a dock for loading onto a barge.

The Erie batch plant is charged by a Bay City crane. The mixer in the tower is a Worthington-Ransome 34-S dual drum.

Deck Slabs Precast, Floated Into Place

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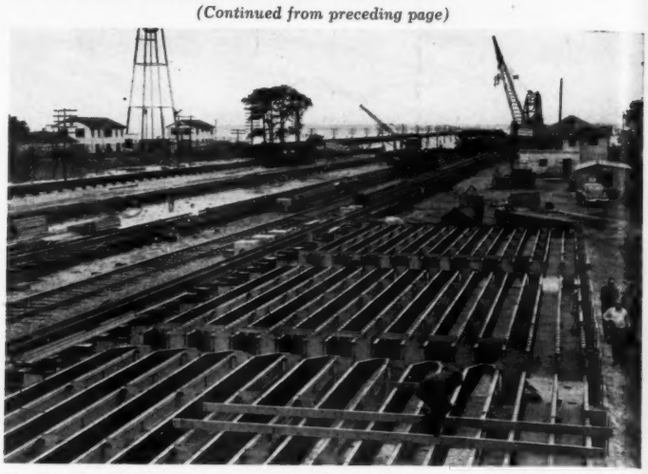

Blaw-Knox forms laid out on a concrete mat in the pile-casting yard. The contractor's field office is in the right background. The L & N main-line track is at extreme left.

South of the mixing plant another track runs down the center of the pile-casting yard out to a loading dock. Most of the material shipped to the job by rail comes in on this spur, and is easily transferred to supply barges for towing out to the bridge. Straddling this track is a Wiley Whirley gantry operating on 30-foot-gage tracks. The big 50-ton steam-driven rig with 110-foot boom is high enough to afford clearance to the railroad cars delivering materials out to the docks. It was brought to the Mississippi job from a Norfolk, Va., shipyard to handle the buckets of concrete used in casting piles and slabs, and for material handling. A locomotive crane running on the spur track performs similar functions. This track is only 175 feet north of the L & N main line.

Big Gantry

Between the Whirley layout and the L & N tracks is another gantry

A BETTER BLOCK
FOR EVERY PURPOSE
"Aye! Many are the rewards of low cost maintenance."
McKISSICK
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SNATCH BLOCK
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All steel construction with 6"-8"-10" diameter steel sheaves, 2" diameter center pins.
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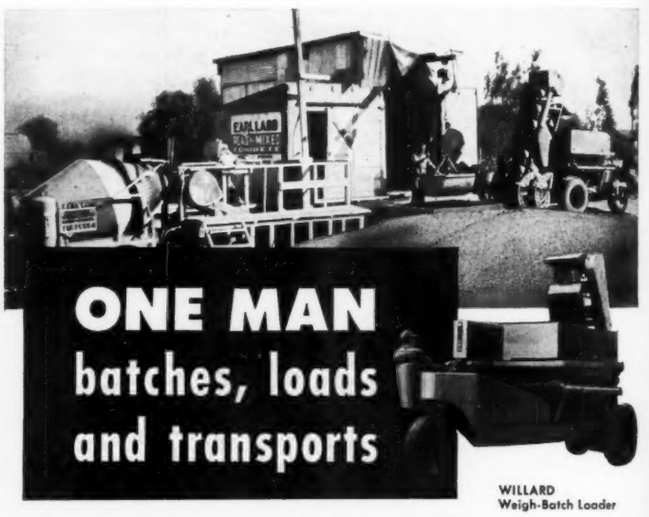

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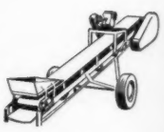
WILLARD-EQUIPPED READY-MIX PLANT

MAKE MONEY with your own Willard-equipped ready-mix plant like the "one man" operation shown above! In this efficient set-up the same man fills the self-loading Willard Weigh-batcher from stockpiled aggregates . . . dumps into a Willard-designed receiving hopper . . . adds bulk cement . . . empties the hopper with a Willard Conveyor into a Willard Truck Mixer . . . and drives the truck mixer to the job. This smooth flow of materials enables any number of truck mixers to follow each other in rapid succession—at a great saving in handling costs. Savings are extra large because bulk cement is used in this "Willard Way" operation.

This whole spread costs very little to buy and surprisingly little to operate. Write for information on profit-making Willard equipment.



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WILLARD Truck Mixer

Manufactured in Galion, Ohio and Lynwood, California

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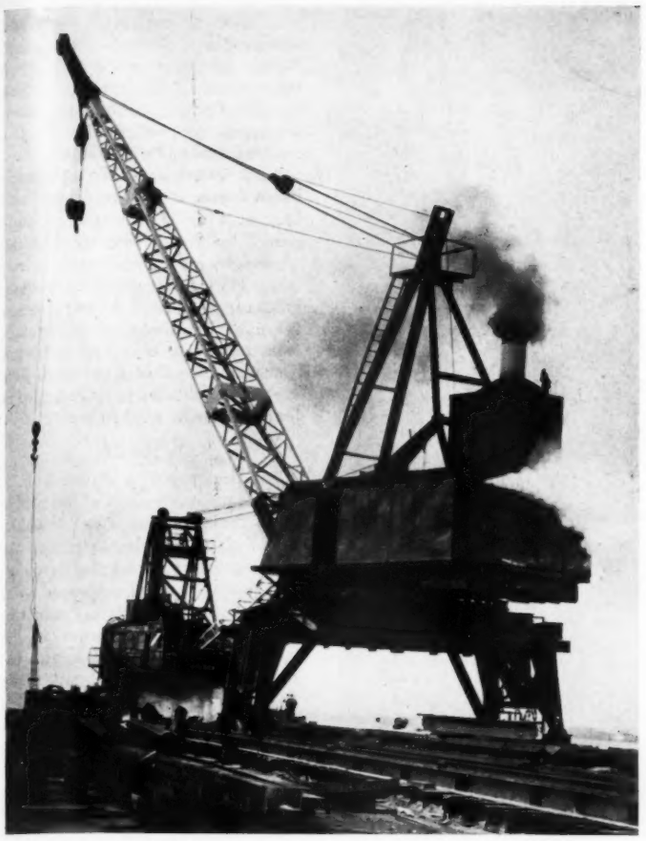
READY MIX *"the Willard Way"*



The big 50-ton Wiley Whirley with a 110-foot boom operates on 30-foot-gage gantry tracks. Behind it is the floating rig Chelsea.

that was transported by barge all the way from Cleveland, Ohio, where it had seen service on a pipe project. The big steel frame was disassembled and towed via the Great Lakes, Mississip River, and Intracoastal Waterway to the job site. It runs on 50-foot-gage tracks, and has a 4-drum pickup that can lift a half slab weighing 122 tons. The lifting mechanism was especially designed for this job in the contractor's Staten Island, N. Y., yard. A combination of steam and compressed air operates the gantry. The big rig is used primarily in the slab construction.

The slab-casting yard is 660 feet long by the width of the gantry, and accommodates forms for casting 11 half-slab sections. Casting is done at the east end of the gantry runway, and slabs are stored at the west or shore end for loading on to barges. Space was provided for storing only 5 slabs, since the work is so well organized that the usual procedure is to move the slabs directly from forms to barge for moving to the bridge.

Blaw-Knox forms of ⅜-inch steel are used for the precast piles and slabs and for the cast-in-place caps. Pile forms are assembled in 10-foot sections and casting is done in alternate rows with the forms 24 inches apart. Forms are usually stripped on the following day and the surface of the concrete is sprayed with Hunt Process curing compound. The work slab had been covered with paper to break the bond between the concrete, and Hunt Process curing compound is sprayed along the sides of the newly-cast piles for that same purpose. The piles then serve as side forms for the casting of other alternate rows of piles. The only forming required is at the pile tips. All reinforcing steel is supplied by the Laclede Steel Co., of St. Louis, Mo.

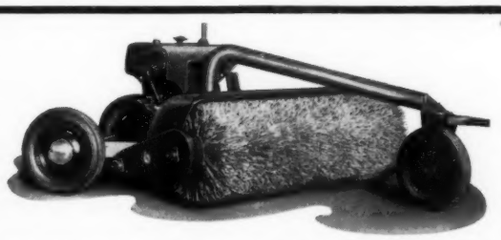
Concrete Placing

Class A 4,000-psi concrete is re-

The concrete from an Insley bucket is discharged into pile forms. Pile casting is done in alternate rows. The Wiley Whirley in the background handles the bucket.

(Continued on next page)

NEW ENGINE POWERED SWEEPER



A new pull type sweeper, engine driven, with many unusual, exclusive features. Main frame of 5" tubular steel, with 5" channel rear frame for rugged strength. 96" x 30" brush, on self-aligning anti-friction bearings, mounted on 3½" tubular frame. Exclusive spring balance permits brush to float over uneven surfaces. Hydraulic control raises and lowers brush. Sweeps at 30° angle, right or left. A sprinkler can be easily attached.

A traction driven model, built along similar design is also available.

TRACTOR MOUNTED SWEEPERS

M-B tractor mounted sweepers are built for various models of Ford, Ferguson, Case and International-Harvester tractors. More than 25 years of sweeper experience has been built into these models. Shafts turn on anti-friction bearings and all moving parts are carefully protected. Easily installed and removed. Hydraulically controlled. Sweeps a 6' path, 30° to the right only. Brooms may be disengaged when travelling.

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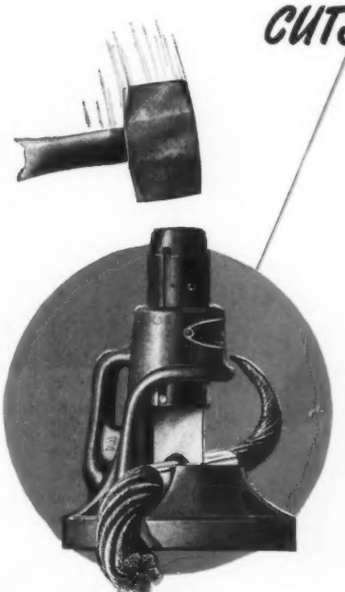

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Especially designed cutting blade and dies assures fast cutting action... The hammer principle eliminates any special skill requirements.

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No jagged ends. The wire rope is cut with ends smooth and clean for perfect threading or splicing.

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Deck Slabs Precast, Floated Into Place

(Continued from preceding page)

quired in the structure. The mix is discharged into buckets—Blaw-Knox, Gar-Bro, or Insley, mostly 2-yard capacity—and hauled to the forms in trucks. Then either the Whirley or the locomotive crane picks up the buckets and conveys them to the forms. There is enough room in the yard to cast 150 piles in a single setup. Piles are not driven until 21 days after casting.

For piles up to 61 feet long a 2-point pickup is used, but for the longer piles a 3 and 4-point pickup is required. Piles are barged out to the bents and driven with a McKiernan-Terry 10-S single-acting hammer. Two M-C&S big floating rigs do the work—the Chelsea and the Cree. The Chelsea is a 130 x 50-foot barge, mounting a 50-ton American Revolver crane with a 130-foot boom. The Cree is a 150 x 55-foot barge, mounting a 75-ton Wiley Whirley with a 110-foot boom. Each rig has a Griffin jet pump and 4-inch jet pipes. Pressure on the jets ranges from 250 to 300 pounds.

Driving 24-inch precast-concrete piles with a McKiernan-Terry 10-S single-acting hammer handled by the floating rig.

A special template, like a checkerboard frame, is used in driving one bent at a time. One end is supported by the driving rig and the other rests on the previously driven bent. No leads are used in driving, but 3 tugger hoists hold and position the pile. Piles are driven through loose sand, clay, and shell to 60-ton bearing in a layer of dense sand. Jets are used to obtain a penetration of at least 20 feet in solid material.

On the Bay

The first pile was driven Feb. 2, 1952 on the eastern end of the bridge and within two months time the initial slab was also in place. In pouring the caps and the piers for the bascule span, concrete was pumped from the Rex Pumpcrete out to buckets on barges in the casting yard slip. The barges are then towed out to the job where floating rigs pick up the buckets and discharge the concrete into the forms. Most of the cap work is handled by a pair of Manitowoc 2000 Speedcranes, one with a 60-foot and the other with a 70-foot boom, and mounted respectively on 35 x 130-foot and 35 x 200-foot barges. The floating equipment fleet is rounded out with various-sized materials scows. Job towing is done with the tugs Cardinal and Chickadee.

At the start of the job, work was concentrated on the east side of the trestle. As the pile-casting production stepped up, the driving moved along smoothly on both sides. Enough piles of the same length were cast at one time to supply the two driving rigs as they moved out from the opposite shores. From 50 to 60 piles were cast in a week. As the piles were driven, caps were poured, and then the deck slabs were set in place.

A half-section of slab contains 57½ yards of concrete and is poured in about 1¼ hours. The 41 x 27½-foot slab is screeded on the long side by a 43-foot screed built of 6-inch channels, and mounted on wheels that ride the side forms. It is moved by a hand winch. Each half-slab has 8 pickup points consisting of holes put through the beams at the corners, and through which 2½-inch bolts are inserted. As with the piles, Hunt Process is used for the curing, and slabs are not moved from the forms for six days.

Setting the Slabs

Then the 50-foot-span gantry picks up the slabs and sets them on

Bury it! Forget it!

Yes, here's a sump pump that all you do is bury it . . . forget it . . . and run it for days. A dry sump cannot hurt this pump. For pumping more liquids . . . faster . . . higher . . . cheaper . . . use an Ingersoll-Rand Air Operated Sump Pump.

These pumps are powered by Ingersoll-Rand "Multi-Vane" air motors which have an unequaled reputation for reliability. Put these dependable sump pumps to work for you earning extra profits. They will pump as much as 250 gallons per minute and will handle heads up to 200 feet.

This Ingersoll-Rand centrifugal type sump pump is the cheapest way to move water, oil, sewage or medium sludge. It's air operated for economy. No need for a standby operator. It consumes a minimum of air. On heads of more than 40 feet air consumption is as much as 30% less than comparable units.

Write today for complete money saving information on this remarkable sump pump.

Size 25 Sump Pump.

Size 35 High Head Sump Pump

The I-R air operated sump pump is available in Sizes 25 or 35. Both types are lightweight for easy carrying by one man. They use dirt-and-liquid-protected bearings for the impeller and motor rotor. All parts are made of bronze, stainless steel, or rust-proofed steel. The Size 25 can also be supplied with an all-bronze exterior when used in corrosive or inflammable liquids.

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steel falsework and cribbing built up from the deck of a materials barge. The falsework is sufficiently high so that when the barge is towed in between the proper bents, the slab is higher than the caps on which it is to rest. The hold of the barge is flooded to lower the slab into position on jacks that have been set on the caps. Next the barge is pulled clear of the bridge and pumped out, while the slab is trued into correct alignment and grade with steamboat ratchets and jacks. Shoes projecting from the bottom of the slab on each side fit into recesses left in the caps. These junction points are grouted in with Embeco, a non-shrink ductile grout.

Since the height of the bridge increases from the abutment on each side out to the bascule, the falsework cribbing on the slab barges is adjusted by shims to any desired elevation. At the abutments the profile elevation of the roadway is 15.0, while at the bascule it is 23.0 to afford a vertical clearance of 17 feet with the span in the lowered position.

As the slabs are built out from the shore, the new roadway is used by the Maxon Dumpcrete trucks that deliver mixed concrete from the plant in the casting yard to the forms for the curb, walks, and median strip. For casting in place on the west side of the bridge, the trucks cross the bay on the existing trestle, continue north along the shore, then double back on the new span.

While the trestle work was in progress, the four main piers for the bascule and side spans were constructed within sheet pile cofferdams. The Manitowoc cranes on the barges drove the sheeting and did the excavating within the coffers. The 18-inch RC foundation piles were driven either by the Cree or the Chelsea. Concrete buckets delivered to the piers by barge were handled by the floating cranes. The bascule span has a steel open-grid deck.

Quantities and Personnel

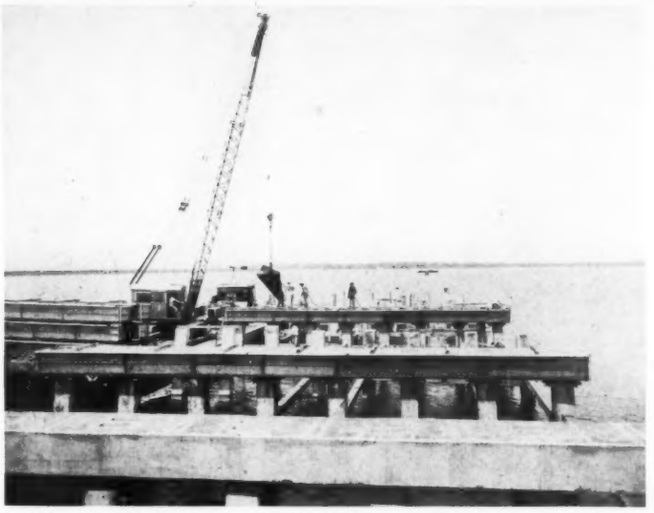
Major items in the Bay St. Louis bridge project include the following:

Bridge concrete, class A	40,090	cu. yds.
Seal concrete	1,261	cu. yds.
Structural steel, bascule and side spans	675	tons
Steel grid floor	5,530	sq. ft.
Reinforcing steel	3,722	tons
Railing	20,059	lin. ft.
Precast concrete piling:		
24-in. square	142,090	lin. ft.
18-in. square	14,430	lin. ft.
Bridge excavation	4,951	cu. yds.

Hazelet & Erdal, consulting engineers of Louisville, Ky., designed the bridge for the Mississippi State Highway Department, and are represented on the project by C. S. Hill, Resident Engineer.

Merritt-Chapman & Scott Corp. is employing an average force of 180 on the contract under the direction of Roderick Hand, Project Manager. Key personnel also includes Capt. J. I. Tooker, Marine Superintendent; E. H. Woolwine, Project Engineer; W. F. Cooper, Yard Superintendent; John Mills, Cofferdam Superintendent; Rufus P. Neely, Office Manager; and T. Aldrich, Superintendent.

The Mississippi State Highway Department is headed by R. A. Harris, Chief Engineer. S. A. Tomlinson, Jr., is Construction Engineer, and E. M. Johnson is Bridge Engineer.

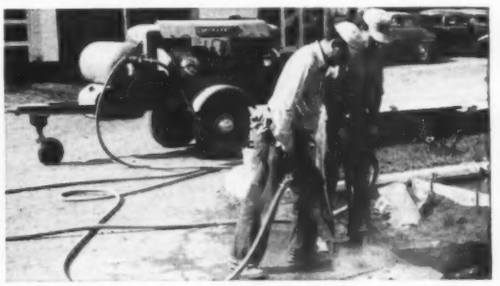


A Manitowoc Speedcrane mounted on a barge handles a concrete bucket in pouring cast-in-place pile caps.

A. O. Smith Plant Manager

George M. Graetz has been appointed Manager of the new eastern plant of A. O. Smith Corp., Welding Products Division. The plant for the production of welding electrodes, now being built at Lancaster, Pa., is to be completed this summer.

75 cfm puts full wallop in a heavy duty breaker.

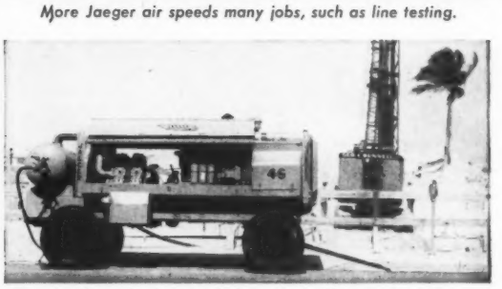


With 125 cfm these tools do 30%-40% more work.

Three 365's — enough capacity for 4 heavy wagon drills.

More Jaeger air speeds many jobs, such as line testing.

Tractor mounted and powered, operates two big drills.



Ample air for heavy pile hammers, with a Jaeger 600.

Only JAEGER has built thousands of compressors in today's "new standard" ratings . . .

75 • 125 • 185 • 250 • 365 • 600 cfm

Any compressor that produces 15% to 25% more air than others, without racing, overheating or vibration, must be engineered to higher standards. Jaeger, alone, has engineered these new standards into thousands of compressor units, whose design features are not found in any other line of portable compressors, *old or new:*

- Balanced 2-stage "W" type compressor in every model from 75 to 600 ft.
- 75% to 100% larger valves; larger intercoolers and air receivers.
- Positive force feed lubrication, standard.
- Relief valve for automatic drainage, standard.
- Automatic "Fuel Miser" standard on all models where speed control means worthwhile fuel saving.
- Bigger clutches than any other compressors; bigger engines operating at conservative speeds.

Ask Your Jaeger Distributor to Prove This: At prices actually less than those still asked for "old standard" compressors, Jaeger compressors provide 15% to 25% greater volume of air at the lowest known cost per cubic foot.

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New Diesel Generator

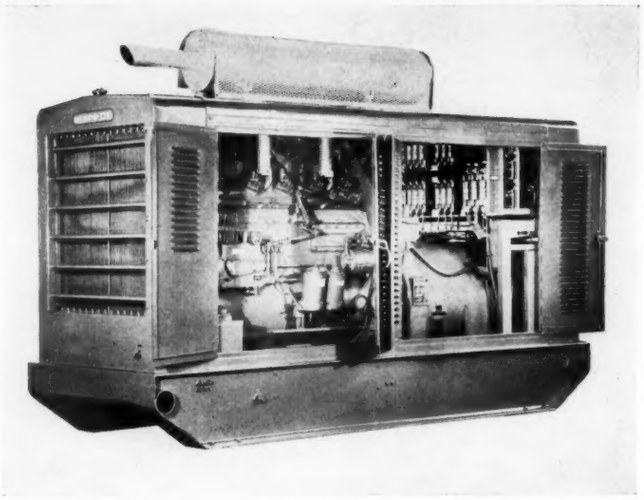
A new diesel-engine generator for large-scale arc-welding field operations has been developed by Ready-Power Co., 11231 Freud St., Detroit, Mich.

The 100 kw unit is recommended for such jobs as the erection of large-capacity storage tanks for liquid fuels and water. Other job applications for the new generator include bridge building, salvaging operations, and other steel work in the field, requiring multiple welders.

The new Ready-Power unit is said to operate a bank of seven welders simultaneously and can also power a 50-hp electric air compressor plus a drop-cord line for operation of power tools and emergency lighting. Model RD24A12 is powered by an International Harvester Diesel engine.

Principal advantages it offers include centralization of power source in a single unit for simplified control and maintenance, and the ability to maintain welding efficiency at distances several times greater than that of gas-driven welders.

For further information write to the company, or use the Request Card at page 18. Circle No. 188.



The new 100-kw Ready-Power generator, Model RD24A12, is designed for large-scale arc-welding operations in the field.

Heavy Press Erected

A 14,000-ton extrusion press—the longest ever erected in this country—has been installed at the Lafayette, Ind., plant of Aluminum Co. of America.

The new press, whose erection is part of the U. S. Air Force program, is capable of extruding aluminum products nearly four times heavier than those coming from presses currently in operation. The press takes a billet 31 inches in diameter and, because of its size, it can squeeze out larger and more intricate shapes for future airplanes. In a wing panel the greater width will mean a stronger airplane skin with less weight and less riveting.

The government will have first call on all production under a lease arrangement between Alcoa and the U. S. Air Force.

Erection of the huge press, a product of Duesseldorf, Germany, was completed within four months by F. H. McGraw & Co., equipment erection specialists, New York, N. Y. Installation was somewhat complicated by German calibrations and specifications which had to be translated into English. McGraw crews had to use special measuring devices with German calibrations and their English equivalents. One casting on the press—the cylinder housing—weighed 107 tons and was 23 feet long, 8½ feet wide, and 14 feet high. The platen weighed 103 tons.

The press will produce aluminum pipe for the petroleum industry, curtain walls for modern buildings, and strong alloy shapes for the marine, railroad car, bus, truck, and trailer industries.

Curing Compounds

A new line of membrane-forming concrete-curing compounds is announced by the Servicised Products Corp., 6051 W. 65th St., Chicago 38, Ill.

When sprayed or painted on vertical surfaces, the curing compounds are said not to run or leave bare uncovered areas. The manufacturer explains that this is due to the use of a false body, which looks and feels like a liquid and causes the curing compound to change from liquid form to a gel when applied as a film on concrete surfaces.

The curing compounds are available in 55-gallon drums.

For further information write to the company, or use the Request Card at page 18. Circle No. 261.

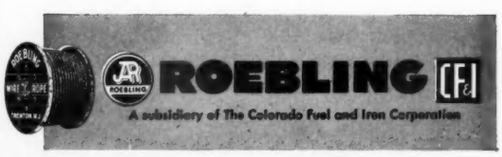
Pittsburgh Corning Moves

Pittsburgh Corning Corp., manufacturer of glass blocks and Foamglas, has moved its general offices from 307 4th Ave., to new quarters at One Gateway Center, Pittsburgh 22, Pa.

Executive, Sales, and Accounting Divisions will be housed at the new address.

IT'S JUST THAT SIMPLE. There's only one reason in the world why 2 out of 3 wire rope users in the excavating and construction field prefer Roebling wire rope . . . *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your machines.



JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

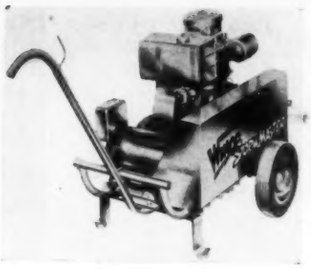
Emergency Generator

A new portable gasoline-engine-driven generator serves as an emergency power plant. The Storm Master Model 3030-11 is sold with or without engine and wheelbarrow base. It has an adjustable mounting to accommodate any engine available in an emergency. According to the manufacturer, some 25 engines representing 11 different makes can be mounted on the unit.

Generator output depends on the size of engine used. For example, 5-hp engines deliver a normal output of 2,000 watts while 7 to 8-hp engines make for an additional reserve capacity up to 50 per cent overload for motor starting. Units of 2½ hp give 200 to 350 watts.

The manufacturer stresses the low initial cost of the generator.

For further information write to the Wincharger Corp, E. 7th & Division Streets, Sioux City 2, Iowa, or use the Request Card at page 18. Circle No. 329.



Air-Entrainment Facts

Purposefully entrained air is a relatively stable foam, whose primary effect in concrete is to reduce the need for a considerable portion of the water-of-convenience. Important secondary effects include increasing the strength of the paste by reducing the water-cement ratio, reducing the basic paste porosity, and increasing resistance of the mass to frost and attack by aggressive waters.

How this occurs and under what conditions is explained in a new booklet containing basic information on the subject. Some of the details include the effect on the strength of concrete, and the practical effects of varying aggregate, cement, water, temperature, and other factors in air entrainment.

The booklet is by C. E. Wuerpel and is based on addresses given at concrete conferences at the University of Minnesota and at Iowa State College.

To obtain this literature write to the Marquette Cement Mfg. Co., 20 N. Wacker Drive, Chicago 6, Ill., or use the Request Card at page 18. Circle No. 262.

Measuring Tapes, Rules

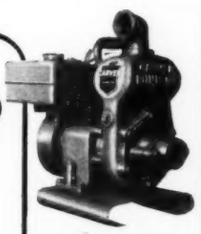
Literature is available on folding rules, measuring tapes, and a caliper rule. A 6-foot folding rule is made of white material that is said not to shrink, stretch, warp, or split, and that washes with soap and water. The company replaces broken slats at a minimum cost. A folding yardstick is offered in a variety of colors.

A steel white-face winding tape marked in feet, inches, and eighths comes in a leather-grained reel cover. Steel-cased tapes are offered in 6, 8, and 10-foot lengths. Replacement blades are available.

A caliper rule measures hole diameters of $\frac{3}{16}$ to $5\frac{1}{4}$ inches and has a 5-inch rule on the reverse side.

To obtain this literature write to Evans & Co., 400 Trumbull St., Elizabeth, N. J., or use the Request Card at page 18. Circle No. 179.

Looking for Pumps?
You Name It!
CARVER'S Got It!



1½" SELF-PRIMING
4000 G.P.H.

CARVER has the complete line of self-priming construction dewatering pumps starting with the 1½" Model KN1½L — 4000 gallons per hour — the lightest 4M rated pump on the market.

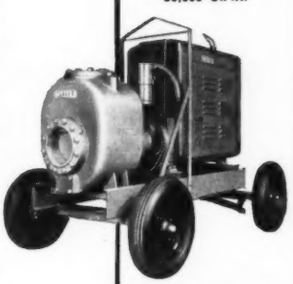
Every CARVER Contractor Pump . . . right up through the 10" giant which will pump 250,000 gallons per hour — has the same simple design, sturdy construction, rugged durability that means efficient performance on every job. No loose parts, only two wearing parts, easily and economically replaced. All models with gasoline, diesel or electric drive.

As for diaphragm pumps, CARVER makes one that will handle the roughest, toughest jobs with ease.

CARVER also manufactures a full line of high-pressure jetting pumps for jetting well points, timber and steel piling, flushing, etc.

For the complete quality line of pumps see your CARVER Distributor today!

3" SELF-PRIMING
30,000 G.P.H.



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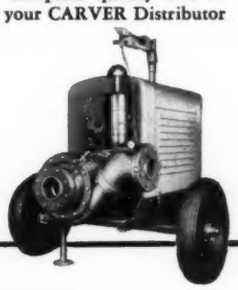
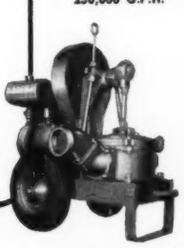


HIGH PRESSURE
JETTING PUMP



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6000 G.P.H.

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CARVER PUMP CO., 1404 Hershey Ave., Muscatine, Iowa

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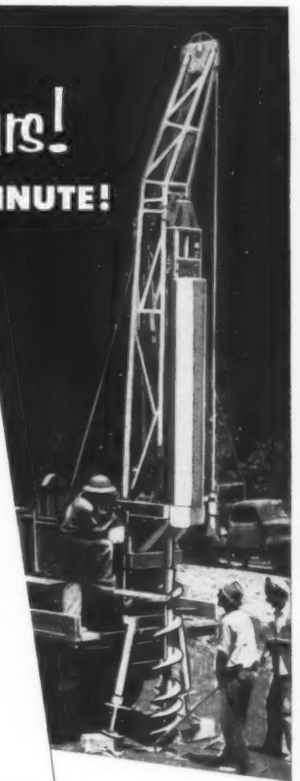
DRILL A FOOT A MINUTE!



FASTER—DEEPER—WIDER! SAVE TIME and MONEY with MODEL HBL!

Here's an earth drill that saves hundreds of man hours! Specially designed for faster prospecting, soil testing, blast hole drilling and shallow well drilling, the powerful Buda HBL sets up in seconds by hydraulic action, pulls 20 feet of auger at one time without moving the truck! Speed and pressure of drill feed is controlled by operator. Model HBL is self powered by Buda diesel or Buda gasoline engine—no extra power accessories are needed—permits drilling larger diameter holes. For fast drilling, rugged service and widest variety of hole depths and diameters, investigate Buda Model HBL Earth Drill.

Largest Range of Depths and Diameters

6 inch diameter to 100 foot depth
8 inch diameter to 100 foot depth
10-12 inch diameter to 50 foot depth
6-42 inch diameter to 7 or 10 foot depths
16-18 inch diameter to 30 foot depth

New versatile Y-1 bores
STRAIGHT OR ANGLE HOLES UP TO 12 FT. DEEP!

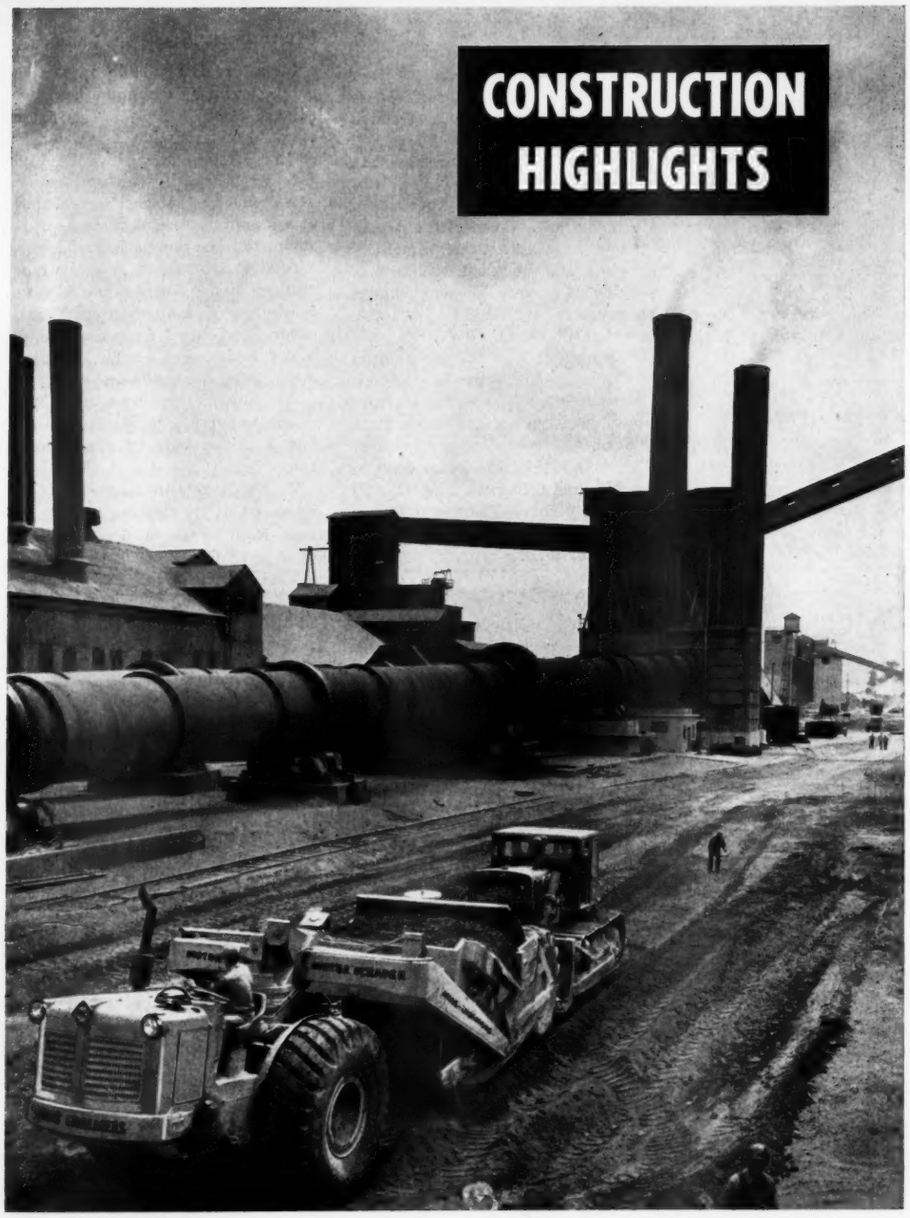
Quickly set up for guard rail drilling, power poles, foundations, piers, posts and many other uses, the Buda Y-1 bores holes 6 to 36 inches in diameter to 12 feet deep—vertically or at almost any angle desired. Economical in operation and maintenance, the self-powered Y-1 is built on a skid frame ready for mounting on a 1½ to 2½ ton vehicle. Full view operating position affords faster operation and maximum safety; hydraulic action gives complete control of speed and pressure. For fast, low cost, versatile drilling see your nearest Buda distributor for complete details on the Buda Y-1.

BUDA — A SUITABLE EARTH DRILL FOR YOUR DRILLING JOB!

BUDA

The Buda Company, Harvey, Illinois

CONSTRUCTION HIGHLIGHTS



BUILDING RAILROAD BED — Here's a correctly matched earth-moving pair at work preparing the bed for a railroad spur in the yards of a large chemical plant. Up front is an Allis-Chalmers TS-300 Motor Scraper, moving up to 18 cubic yards of dirt every pass. Push-loading the TS-300 to a full, fast payload is an Allis-Chalmers HD-20 Tractor, with hydraulic torque converter drive.

WORKING OIL MIX king size. That's what big AD-40 Motor Grader is doing on a black-top job. Built-in power steering simplifies operator's by eliminating tiring "wheel fight."

FINISHING BETWEEN FORMS takes preci work. That's what this contractor is getting from Model D . . . the low-cost motor grader, proved dozens of jobs by thousands of users.

FEEDING RIVER SAND to dragline is a tough but this HD-9 takes it in stride. Its Positive Seal t wheels, idlers, support rollers keep grease in, tro out . . . require lubrication only every 1,000-ho

Allis-Chalmers equipment at work . . . helping small contracto

CLOSE-QUARTER WORK is made for the Allis-Chalmers Model D. This versatile motor grader handles dozens of jobs, from road building to landscaping, easily and at low cost. And its usefulness is multiplied by several easily mounted attachments, including hydraulically controlled scarifier and rear-end loader.

LOADING BIG BOULDERS from rock pile to t is a simple matter for this Allis-Chalmers HD- with four cubic yard, front-mounted tractor sh

ENING ROAD. Owner found his HD-15 gives up to 25 percent more output on short cycle g, because operator can go from any forward to reverse speed in just one lever shift.

HIGH-SPEED DIRT-MOVING TEAM loads and hauls big yardage on this large-scale operation. An Allis-Chalmers torque converter drive tractor helps load a trio of TS-200 Motor Scrapers and gives them a fast, smooth start. Quick to get moving, hydraulically controlled Motor Scrapers speed to fill with capacity loads to 13 cu. yd., and with positive forced ejection, dump fast and clean.

ER DITCHES result because an AD-40 operator see graders front wheels and both ends of blade because he has the advantages of Allis-Chalmers sive ROLL-AWAY moldboard.

FULLY LOADED and ready to make a sharp, downhill turn, this Allis-Chalmers 18-ton-capacity TR-200 Rock Wagon — with air brakes and low center of gravity — is under full control all the way.

DIGGING TRENCHES. This hydraulically controlled, front-end trench hoe is only one of a dozen attachments making Allis-Chalmers HD-5G the most useful tractor in the world.

E-MAN CONSTRUCTION CREW. This G with two cubic yard shovel, shown rough ng here, also lifts, dozes, digs, handles most bulk rials faster, better, more economically than before.

TOUGH DOZING JOBS are made to order for the torque converter HD-20. Matching power to the load exactly, this huge tractor automatically moves load at highest speed that conditions permit.

d fleet operators handle today's jobs at lower cost

KFILLING on a water main and sewer construction job is just one of dozens of ways cost-conscious actors use the versatile HD-5 Crawler.

FLEET OWNERS GO ALLIS-CHALMERS, TOO. Contractors find the design advantages of Persian orange equipment bring more profit to their operations; and that rugged construction keeps it on the job longer. Now, to fit their jobs they can select from seven scraper sizes . . . for use with any tractor.

Bookkeeping Machine Letters Descriptions

Mechanized accounting, including full description of entries, is offered in a new bookkeeping machine. The Remington Rand Low-Cost has a typewriter keyboard and a minimum of five registers. According to the manufacturer, it may be operated by a clerk with limited bookkeeping knowledge, and can be switched from one type of bookkeeping job to another.

The machine produces records with full description and mechanical proof for every entry, instantly computed account balances, and automatically accumulated accounting-control figures. Along with the high-speed figure mechanism, the touch-operated alphabetic keyboard permits every item to be described as fully as is needed on every record. The entire range of bookkeeping applications can be turned out, including accounts receivable, accounts payable, payroll, general ledger, sales analysis, cost distribution, and invoices.

All computations are made automatically and step by step within the registers. The cross register, which computes the new account balance, will lock automatically if the balance is transcribed incorrectly. The vertical registers, which compute the column totals, will also lock if an entry is not made in its correct decimal position.

For further information write to Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y., or use the Request Card at page 18. Circle No. 228.

Chemical Brush-Clearance

A report from the Thompson Chemicals Corp., 3028 Locust St., St. Louis 3, Mo., describes its 1952 field research on the use of chemicals for right-of-way clearance and maintenance. Both foliage spraying and basal-bark-application techniques are reported on as well as the use of truck, tractor, and knapsack sprayers.

The report covers research on more than 3,000 acres located in the Arkansas and Missouri Ozark regions. This area was selected because almost every type of brush and weed problem is encountered here. Moreover, the rugged terrain provided an opportunity to work out solutions to spray problems which are encountered along right-of-ways elsewhere.

Pentyl esters, the company states in its report, were effective at lower costs.

To obtain this literature write to the company and request Station Paper No. 12, or use the Request Card at page 18. Circle No. 196.

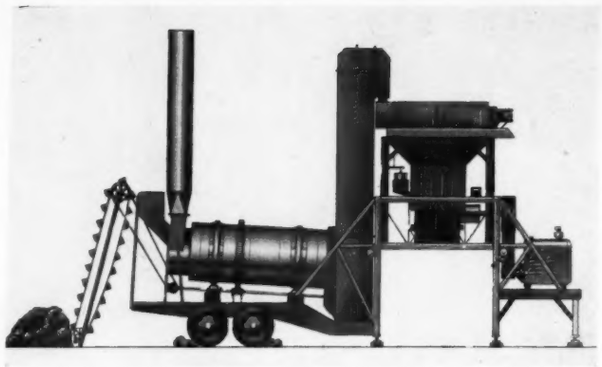
Patent Scaffolding Branch

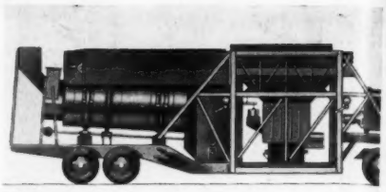
A new branch office has been opened by the Patent Scaffolding Co., Inc., Long Island City 1, N. Y., at 7140 N. Miami, Fla.

Patent Scaffolding manufactures and distributes modern steel and aluminum scaffolds for building construction, repair, and renovation.

The new property provides 1,500 square feet of office space, 11,000 square feet of covered storage, and 15,000 square feet of open storage.

New Portable Asphalt Plant





A portable, integrally powered, 1,000-pound-capacity, batch-type asphalt plant is announced by the Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles, Calif. To place the plant in operation, the mixing unit is raised by an elevator device. In transit, the plant complies with highway clearances, both in height and weight, and may be towed by a truck-tractor. For further information write to the company or use the Request Card at page 18. Circle No. 257.

HEILINER

J. P. SINNA USES 13-YD. HEILINERS

to move 72,000-yds. of clay and hardpan for a road widening and relocation job in Minnesota. Each unit is moving 1250-yds. per 10-hour day on a 500-ft. average haul. These 13-yd. 2C500 Heiliners are ideal for short haul work where high speed and maneuverability are essential, yet they have all the capacity, speed and power necessary for long haul jobs.

There's sure to be a popular Heiliner, either 13-yd. or 18-yd., on a job near your location. It will pay you to watch their performance on the job, get facts and figures from the men who own and operate them. Your nearest Heil distributor will gladly tell you where you can see Heiliners in action, and explain every feature which makes them first choice with so many contractors like J. P. Sinna.

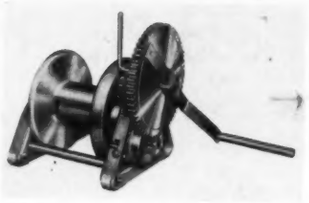
13 and 18-yd. Heiliner Scrapers

20-yd. Heiliner Bottom Dump Wagon

6, 9, 11 and 16-yd. Tractor Drawn Scrapers

Cable Power Control Un

Hand Winch Announced



A mechanical hand winch with low-gear load capacities up to 10,000 pounds has been announced by the St. Anthony Machine Products Co., Dept. KP, 2424 E. Franklin Ave., Minneapolis, Minn. A 1-inch Skildrill or similar power source can be attached with a special adapter for electric operation of the Handiwinch, enabling the operator to handle loads up to 1,000 pounds at 10 fpm.

The Stampco portable winch has both high and low gearing. Brake design features a self-operating ratchet ring. The chisel-type spring-loaded dog is said to permit jam-proof operation of the braking device.

Load capacity at low gear is 10,000 pounds at 27:1 reduction; capacity at high gear is 1,900 pounds at 4.5:1 reduction.

The hand-crank drive shaft is fitted with a large ball retainer. According to the manufacturer, the crank can be safely left in gear and provides flywheel action for smooth control in lowering load.

For further information write to the company, or use the Request Card at page 18. Circle No. 206.

Crane Installations

A 12-page picture book showing the varied applications of its crane line on docks, barges, and ships is offered by the Thew Shovel Co., 28th St. & Fulton Road, Lorain, Ohio. The booklet is illustrated and has job descriptions.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 204.

A tree is removed by pushing and lifting with the Tree Grubber.

Puller Butts Tree And Lifts It Out

A new tractor-mounted tree puller removes a tree by pushing and lifting it. The tractor, with the Tree-Grubber attached, backs into a tree and pushes it horizontally. At the same time, the hydraulically operated puller lifts the tree vertically. This exerts sufficient diagonal force to push the tree out of the ground at about a 45 degree angle. The manufacturer states that it will remove trees up to 6 inches in diameter.

The tree puller attaches to any tractor with a 3-point hydraulic implement hitch. It is made in two models; one for Ford, Ferguson, and similar tractors, and the other for WD Allis-Chalmers. The unit weighs 80 pounds.

Removing trees this way is a one-man operation. Since the tree is forced out of the ground away from the operator, the danger of the tree falling on the operator is eliminated.

For further information write to the Continental Mfg. Co., Box 983, Kilgore, Texas, or use the Request Card at page 18. Circle No. 236.

Standardized Hangars

A new illustrated catalog on structures for civil and military aircraft has been published by the Luria Engineering Co., 500 Fifth Ave., New York 36, N. Y. It contains descriptions, photographs, cross-sectional drawings, and specifications of various types of standardized hangars, lean-to's and clear-span service buildings.

Advantages listed are lower costs, speed of erection, permanence of steel-frame design and the adaptability of the structures to special requirements.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 233.

Resealing Joints, Cracks

"Resealing Joints and Cracks in Concrete Pavement" (Bulletin 63), by J. C. Robbers and John H. Swanberg, is a new pamphlet published by the Highway Research Board. It describes an experimental project conducted in Minnesota to study the cutting and cleaning of joints and cracks in concrete pavements, and resealing them with hot-poured rubber asphalt. The study discusses methods, equipment, materials, costs.

The bulletin can be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C., for 45 cents.

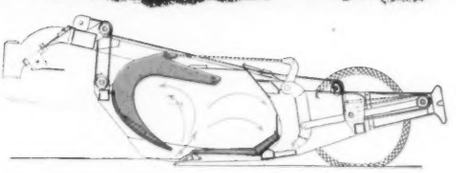
"The best balanced, easiest loading and lowest maintenance unit ever operated under my supervision during thirty years road experience"

says J. P. Sinna president

J. P. SINNA and SON
St. Paul, Minnesota

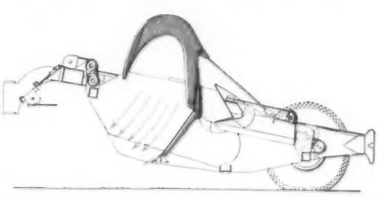
WHEN you want the last word on low-cost earthmoving and the kind of scraper performance that trims cycle time to the bone, ask Heiliner owners like J. P. Sinna and Son. They're the boys who know an easy operating, high producing rig when they see one, and after 30 years of building good roads, J. P. Sinna knows to the last ounce what to expect from his equipment. What he expects from his earthmovers he *gets* from Heiliners . . . the easy loading, fast hauling and easy spreading characteristics that speed the job . . . the well-balanced design and *correctly* applied power which save horsepower and fuel consumption . . . the low maintenance and easy servicing that reduce downtime.

When it comes right down to choosing an earthmover, you choose on the basis of performance, big production and trouble-free operation. Be sure to investigate every advantage of Heiliners before you start your next contract.



FAST, EASY LOADING

The bowl of the Heiliner is designed to "boil" up a fountain of dirt in the *center* of the bowl, quickly heaping both back and front with evenly balanced pay load in a short digging distance. With Heil's planetary drive, the final reduction is in the drive wheels, where it provides a smooth application of lugging power from engine to tire for the greatest utilization of available horsepower. Heiliner's extra-large rim size permits greater ground contact area for better traction and flotation in soft going.



"TILTING FLOOR" FORCED EJECTION

This exclusive Heiliner feature is the simplest, most efficient type of positive forced ejection known. It assures ejection of the entire load with no leftover yardage . . . fast, smooth spreading with minimum horsepower requirements. The floor of the bowl is hinged behind the cutting edge and simply tilts up to a 75° angle by means of a positive ram action. After overcoming the slight initial static friction, the only pressure to be overcome is that exerted by the load on the sides of the bowl. With the ordinary square bowl, more horsepower is needed to overcome the tremendous pressure of tons of heavy dirt on the bottom of the bowl, as well as against the sides.

BALANCED POWER—BALANCED DESIGN

Skillful, balanced design of both tractor and scraper distributes weight properly and utilizes every possible mechanical advantage to apply maximum drawbar pull to the cutting edge. *Exactly* right power, correctly applied at the point of action, *utilizes* horsepower instead of wasting it. Spinning the drive wheels in the pit doesn't put dirt in the bowl! There's plenty of power in the big diesel engine to meet every job condition efficiently, with ample reserve to handle the toughest jobs.

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Kansas Citys Get Flood Protection

Basic Project Work to Be Finished in 1954; Restoration Program, Following 1951 Flood, Is Virtually Completed

• WHEN the Kansas River goes on its next rampage, industrial areas of the Kansas Citys, which were laid low by the great flood of 1951, will not be so easily plundered, at least as far as local protection works are concerned. However, the 60,000-square-mile Kansas River Basin, which drains down the Kansas River to join the Missouri River at this midwestern metropolis, still lacks most of the reservoirs so badly needed to take off the top of major floodwaters so that they can be so contained within the levees and floodwalls at the Kansas Citys.

A Koehring Dumptor being loaded with fines in the rock quarry.
Houck Photo

Under authorization and funds voted by Congress and local interest cooperation, the Kansas Citys Local Protection Project consisting of levees, floodwalls, channel improvements, raising of bridges, a cutoff in the Missouri River, and other allied works, was put under construction in 1940. The over-all project, now about 70 per cent completed, is scheduled for completion in 1954. Total estimated cost is approximately $43,000,000 and about $30,000,000 has been expended to date.

In addition, repair and restoration work on the existing levees, necessitated largely by damage inflicted by the 1951 flood, has virtually been completed at a cost of about $15,000,000.

The Kansas Citys project embraces eight distinct units representing respective industrial areas. Three of these, the Argentine, Armourdale, Fairfax and part of the Central Industrial District, which suffered most severely in the 1951 flood, are in Kansas City, Kans. The remainder of the protection system is in Kansas City, Mo. In proceeding with the remaining construction of the project, some adjustments, deemed advisable in view of observations of the 1951 flood and 1952 high waters, are being incorporated. These include some levee portions featuring longer slopes, 6-foot-thick rock toes, and impervious rock-paved banks with all-weather and flood-fighting roads atop the crowns.

During 1952 in the Kansas River Basin, construction started on Tuttle Creek Dam and Reservoir, an $87,000,000 project on the Big Blue River,

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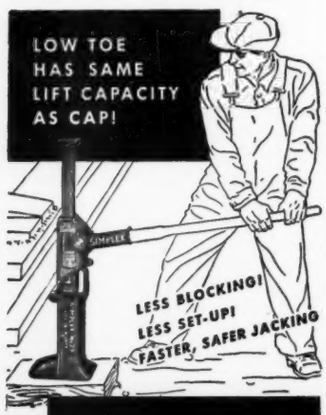

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Lift or Lower the Load Notch by Notch—cannot be Tripped.

With Simplex Ratchet Lowering Jacks minimum toe clearance is necessary. Loads are usually lifted from the ground to the toe of the jack by pinch bars or wedges. Only Simplex Jacks provide equal lift capacity on toe or cap. No other jacks offer such a combination of low cost and all-purpose utility. In fast jacking action—extra-safety features—and rugged strength for longer life, Simplex Ratchet Lowering Jacks give you more for your money! Available in capacities of 1½ to 35 tons. Write today for Bulletin: Industrial 49.

SAFETY SUGGESTION—Use thin wood block—Don't lift or lower steel against steel.

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Jacks

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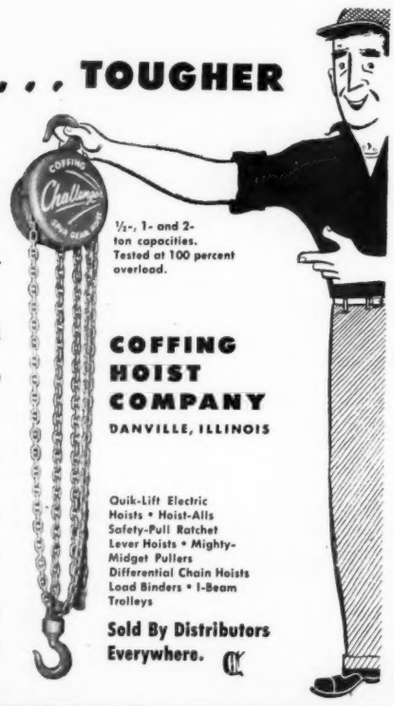
Never before such easy portability and rugged, shock-resisting strength in a spur-gear hoist . . . never such simplicity of design and ease of servicing.

Light weight—carry it in one hand; set it up anywhere. One-ton model weighs only 39½ lbs.

All Steel—even the housing. Takes shock loads and impact as only steel can.

Easy to Service—may be completely disassembled in minutes with ordinary tools. Simplest spur-gear hoist ever built.

Find out how this better spur-gear hoist can improve operations and save expense for you. Write for bulletin C6C.



½-, 1- and 2-ton capacities. Tested at 100 percent overload.

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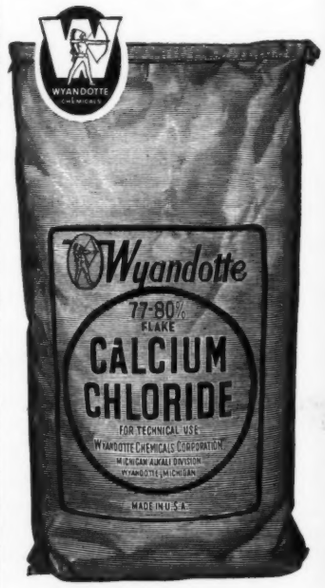

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north of Manhattan, Kans. However, completion and operation is not scheduled until about 5 years from now. Since the 1951 flood the Kansas City District of the Corps of Engineers, U. S. Army, also has completed Harlan County Reservoir on the Republican River in Nebraska, another tributary of the Kansas River. Kanopolis Reservoir on the Smoky Hill River some distance from the Kansas Citys has been in operation since 1948.

Work was under way on several of the Kansas Citys Project units when the 1951 flood descended. Current activity at the units most seriously affected by the flood, and the contractors participating are as follows:

Argentine: Located on the right bank of the Kansas River from 9.5 to 3.4 miles above its confluence with the Missouri River, its 2,031 industrial acres are subject to flood. The Kaw Valley Drainage District pumping plant is being rebuilt. Three contractors, Condon - Cunningham Co., Omaha, Nebr., J. A. Tobin Construction Co., Kansas City, Kans., and L. G. Barcus & Sons, Inc., Kansas City, Kans., have recently completed, except for dressing and seeding, $1,397,856 jobs. The Storms & Frew Construction Co., Kansas City, Kans., will finish a $2,176,863 contract in May. Massman Construction Co., Kansas City, Mo., started a $553,393 contract in January, with completion scheduled for November.

Armourdale: On the left bank of the Kansas River, this unit extends 6.7 miles upstream from the Kansas-Missouri River confluence. Totalling 1,976 acres subject to flood, it is one of the largest flood-protection units from the standpoint of values of industrial and residential properties. George Bennett Construction Co., Kansas City, Kans., completed a restoration contract in January and is now working on another contract, scheduled for completion April 1, 1954. R. G. Aldridge, Kansas City, Kans., is building the Osage Avenue pumping plant which is scheduled for completion April 15, 1954.

Fairfax-Jersey Creek: Located on the right bank of the Missouri River in Kansas between mile 385.2 and mile 378.9 at the confluence with the Kansas River, it contains 2,036 acres of industrial property and the 779-acre Fairfax Airport. Major contracts under way are the Fairfax-Jersey Creek sewer, let to J. A. Tobin Construction Co., and L. G. Barcus & Sons, for $1,545,760; raising the levee, to George Bennett for $1,300,695; Jersey Creek sewer shutter gate, to Tobin and Barcus for $22,000; and four new pumping plants, to L. G. Barcus & Sons for $553,548.

Armourdale Project

A representative job is the contract of George Bennett Construction Co., awarded January 26, 1953, on a low bid of $928,363. Work started February 3 and was 5 per cent complete in March when visited by CONTRACTORS AND ENGINEERS.

The contract is for restoration of more than 2 miles of damaged levee on the left bank of the Kansas River from 12th Street Bridge, Station 131, northwest to Mattoon Creek, Station 13.

A typical section is from Station 93 to Station 100, an embankment featuring a rock-filled toe 37 feet wide and 6 feet thick, 15 feet below mean low water at elevation 725. The embankment slopes upward and landward from the toe approximately 195 feet at 1 on 3½, ending with a 10-foot level crown at elevation 766. Continuing down the other side, the drop is 1 on 4 for approximately 40 feet to natural ground at about 756.

Materials Cross Section

Both fill and excavation are involved in the reconstruction, depending on the topography. In some places the old levee is being cut to a new slope. In other places floodwaters left material heaped in the wrong places and the original embankment was washed away. New embankments are being built with borrow. The debris excavated from the levee area is hauled away to a

(Continued on next page)

A Hendrix 3½ - yard drag bucket is loading a bottom-dump Euclid in a borrow pit. *Houck Photo*

BARNES PUMPS HELP HANDLE SEEPAGE ON GIANT CANADIAN HYDRO PROJECT!

5,500 men working on day and night shifts — two 5½-mile-long supply tunnels, 45-ft. in finished diameter, extending under a densely populated area . . . a 2¼-mile canal designed to carry 40,000 c.f.s. . . . a new power house with installed capacity of 1,200,000 h.p. . . . an expenditure of $300,000,000 — these are highlights of the gigantic project now under way at Niagara Falls which is being rushed to completion by The Hydro-Electric Power Commission of Ontario to meet the growing demands for power in a booming industrial area.

When completed in 1956, this generating station located in the side wall of the Niagara gorge and six miles below the Falls, will stand as another sound engineering achievement attesting to the progressiveness of The Hydro-Electric Power Commission of Ontario and the manner in which it meets its obligations as a public servant.

The Barnes Manufacturing Co. is honored to have its pumps selected for the important work of helping control surface and seepage water in the construction of this project.

Barnes 90M Self-Priming Centrifugal Pumps Operate 24 Hours a Day in Helping to Control Surface and Seepage Water in Canal Section of Vast Hydro-Electric Power Commission's Sir Adam Beck-Niagara Generating Station No. 2.

BARNES MANUFACTURING CO.

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Kansas Citys Get Flood Protection

(Continued from preceding page)

waste area for disposal since it is considered unsuitable for use in the levee.

Fills are placed in 6-inch lifts and compacted with sheepsfoot rollers. Excavation on old levee banks is being done with bulldozers and scrapers. A minimum of 5 feet of impervious material, mostly compacted clay, is specified on the river-side of the slope from elevation 735 to the crown. Below this point the levee is mostly pervious.

A limestone-rock riprap facing is installed from the land side of the rock toe 15 feet under water. This starts at 6 feet thick and narrows to 22 inches in 65 feet, and then continues to the crown with a 22-inch coating of riprap.

Left to right: M. Brayles, Chief of Construction Division, Kansas City District, Corps of Engineers; Col. L. J. Lincoln, Kansas City District Engineer; Brig. Gen. W. E. Potter, Missouri River Division Engineer. *Corps of Engineers Photo*

Equipment Strategy

One problem was to lay out the work so all phases could be moved forward at once.

At the upper end, Stations 13 to 55, the contractor had to build a new bank with much of the material coming from a nearby borrow area. An 80-D Northwest dragline with 75-foot boom and 3½-yard Hendrix bucket, loaded a 4-unit fleet of 16-yard Euclids which bottom-dumped in the embankment base. Six-inch lifts were compacted with two sheepsfoot rollers pulled by D8's. Three 16-ward Wooldridge scrapers, pulled and push-loaded by D8's, worked the grade.

Downstream from this section, just below the Kansas Avenue Bridge, an 80-D Northwest dragline with 75-foot boom and 2½-yard Yaun bucket, was mounted on a barge to dig the underwater trench for the rock toe. The bucket was purposely

For lasting high visibility in all kinds of weather, fieldmen's choice is VISKON flagging tape. VISKON is rugged, bright... colors won't run. Choose brilliant red, orange, blue, yellow or white. Wet or dry, VISKON won't rope! Stays pliable, easy-to-tie in coldest weather. Get VISKON on the handy core to loop right on your belt. Non-toxic. Easy to write on. Standard put-up 1½ inches wide, 300 feet to a roll... other sizes available.

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AMERICA'S No. 1 BUY ON ANY JOB YEAR AROUND

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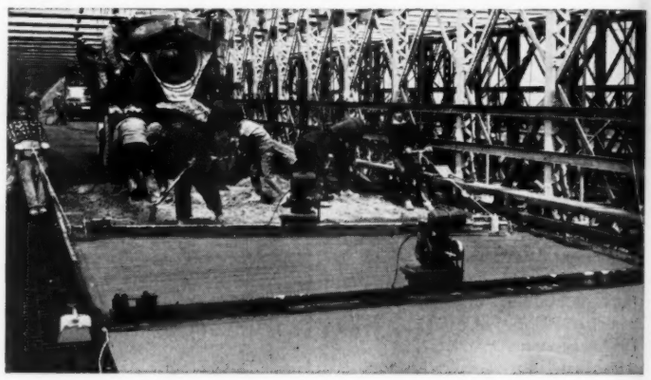
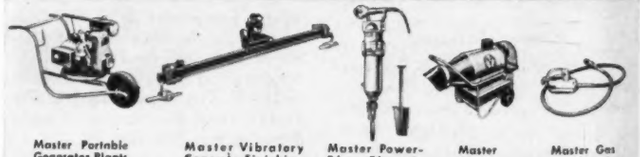


speeds roadwork and floor finishing, too!

MASTER SCREEDS strike off and compact 6,000 square feet per hour, without need of additional vibration. There are MASTER SCREEDS for flat, circular or parabolic surfaces in all sizes. Write for Catalog No. 942. And for ideal floor finishing you can't beat MASTER SCREED teamed with the new scientifically balanced TURN-A-TROWEL for fast, easy finish and mobility.

Only MASTER TURN-A-TROWEL provides quick change from wide compacting trowel to trowel finish. Write for Catalog No. 939.

MASTER VIBRATOR COMPANY • DAYTON 1, OHIO



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BETTER PRODUCTS FOR BIGGER PROFITS

small for the size of the dragline because it dug into the river more easily under water. The sand which was dredged up was dumped back into the river a boom's swing backward. As the trench lengthened, the barge was pulled upstream by a motorized barge-mounted hoist with its two cables anchored on the upstream bank. This kept the barge at right angles to the river and the current.

Rock for the toe trench followed about 500 feet downstream. Forty dump trucks delivered quarry-run rock from the contractor's own quarry and dumped it in the river in a continuous row about 20 feet from the bank with an access ramp about every 500 feet. This formed a jetty approximately 30 feet wide and 2 or 3 feet above water level. Loads were leveled with a D7.

The rock jetty was maintained only for short lengths at a time as the lower end was continuously being torn up and dumped in the pre-excavated toe trench a few feet from the river side. A No. 6 Northwest dragline with a 60-foot boom and 2-yard Hendrix bucket sitting on the jetty worked upstream and alternated between grading embankment and making the jetty disappear under water.

Near the 12th Street Bridge, an 80-D Northwest dragline with 75-foot boom and 2½-yard Hendrix bucket, boomed fill material and loaded into a 7-unit fleet of Koehring Dumptors.

Rock Quarry

Quarry-run limestone was produced in abundant quantities in the contractor's own quarry about 2½ miles from the job near 47th Street and Nall Avenue where stratified rock was blasted and shovel-loaded without mechanical crushing.

The rock bank, high on a hill, was drilled with 20-foot-deep 2-inch-diameter blast holes with three No. 350 Joy wagon drills, using 6-point center-hole Timken detachable bits. Air came from a 600-cubic-foot Joy compressor.

Thirty holes, spaced 10 to 15 feet, were loaded at a time with 28 per cent Atlas dynamite and fired noon and night with a "one-two punch" using Nos. 1 and 2 delay electric-blasting caps. The low-strength explosive loosened the rock with little shatter and left most of it in the bank.

Two Model 6 Northwest shovels with 1½-yard dippers raked the face and loaded into a mixed fleet of 40 rented 1½-ton trucks—Fords, Chevrolets, and Internationals with Anthony, Hercules, and Galion dump bodies.

A fast shuttling Koehring Dumptor, loaded by the shovels, wasted fines nearby. While light-blasting reduced unusable fines, it increased large sizes. Limestone slabs too large for use were nosed to one side where they were "popped" with a 3,000-pound cast-iron skull cracker from a line on the 50-foot boom of a ¾-yard Lorain.

A D8 completed quarry equipment.

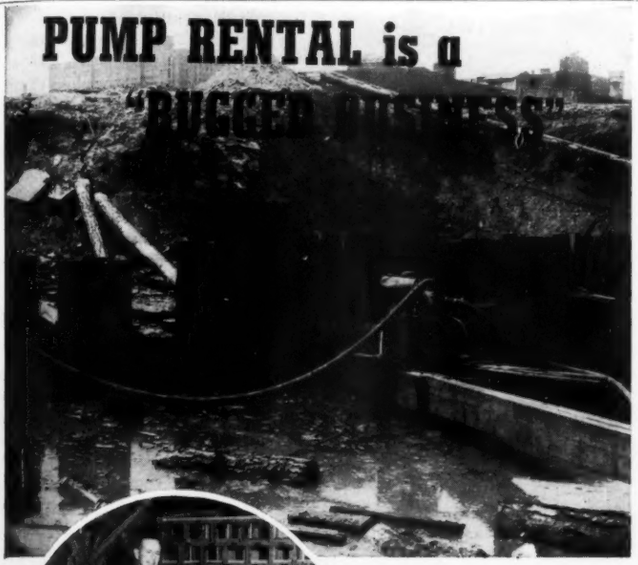
Quantities and Personnel

The approximate quantities on this job were:

Excavation	416,000 cu. yds.
Embankment	426,000 cu. yds.
Rock Fill	225,000 tons

For the Corps of Engineers, U. S. Army, Col. L. J. Lincoln is District Engineer and W. F. Bingham is Project Engineer. For Bennett Construction Co., George Bennett is owner; Joseph Supika, General Superintendent; A. C. Elson, Chief Engineer; and Glenn Kistler, Project Superintendent.

PUMP RENTAL is a "BUGGER OUTFITS"



James King, General Manager of Birmingham Rock Bit Company says:

"We operate one of the largest pump rental fleets in Alabama, and our pumps are Marlow exclusively. We wanted pumps that would stay on the job longer without maintenance, that's why we chose Marlows. Our customers are well satisfied with Marlow Performance."

. . . *and* MARLOWS *are built to take tough on-the-job abuse!*

Sure! Marlow Pumps are built to take tough day-in-and-day-out use in the field without shutdown for maintenance or repair. That's why more and more rental fleet operators are *standardizing* on these dependable Marlow Engine-Driven Self-Priming Centrifugals, and that's why contractors, too, are *buying more Marlows than any other pump*, because Marlows have the features they demand.

Marlow builds models in all A.G.C. ratings from 4M to 200M, 1½" to 10"—plus many other models including the Famous MARLOW "Mud Hog".

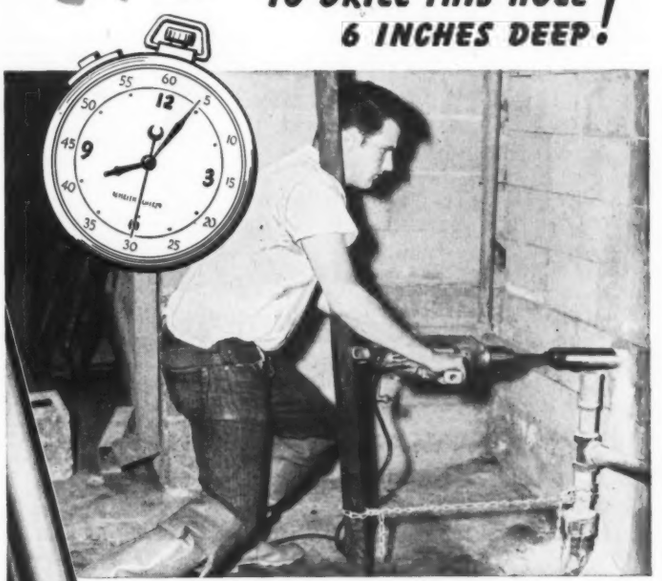
For complete information on these modern self-priming centrifugal pumps, see your Marlow dealer or write for bulletin C-52.

337

- SIMPLE CONSTRUCTION
- LONGER LIFE
- LOWER MAINTENANCE
- FASTER PRIMING
- HANDLES TRASH
- HIGH EFFICIENCY
- LOW FUEL COST

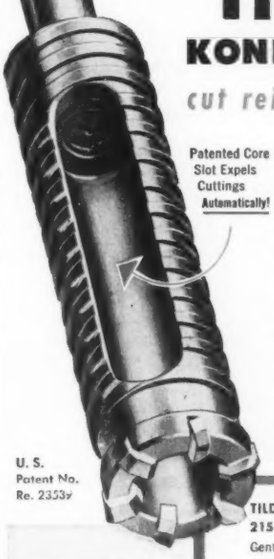
MARLOW PUMPS RIDGEWOOD, NEW JERSEY
Branch Plants: DeQueen, Arkansas; West Chicago, Illinois
Other factories in France and England. Distributors and Dealers everywhere.

4½ MINUTES TO DRILL THIS HOLE 6 INCHES DEEP!



TILDEN ROTARY KONKRETE KORE DRILLS

cut reinforcing rods in concrete!



Under the actual on-the-job conditions shown above, a Tilden 2½" diameter Rotary Konkrete Kore Drill cut through 6" of concrete—including crossed steel reinforcing rods—*in just 4½ minutes!* The straight, clean, ready-to-use holes permitted immediate running of 2" pipe. You consistently get 5 to 7 times more holes without resharpening with a Tilden Drill—and free factory sharpening is still available on sizes from 3/16" to 4" diameters. Tilden Drills can be used with ordinary electric or rotary air motors. Interchangeable shanks are available for any depth hole.

Find out about this revolutionary drill TODAY! Consult our Engineering Department without obligation, on your drilling problems.

Sold Through Distributors Everywhere

WRITE TODAY for free illustrated catalog. Please describe your drilling problem in detail.

TILDEN TOOL MANUFACTURING COMPANY
215 Los Molinos, San Clemente, Calif.

Gentlemen: Please send me without obligation, complete information on the Rotary Konkrete Kore Drill.

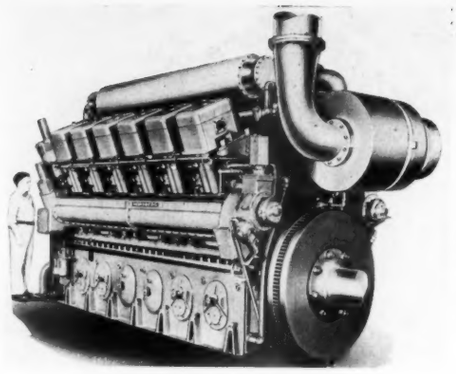
Name_____ Title_____

Company_____

Address_____

Four-Cycle Engines In High Hp Range

A new series of 4-cycle V-type engines for stationary and marine uses is announced by the Nordberg Mfg. Co., Chase and Oklahoma Aves., Milwaukee 7, Wis. The Supairthermal engines are built with 12 or 16 cylinders of 13-inch bore and 16½-inch stroke covering a range from 2,400 to 4,260 hp at 450 to 600 rpm. The net weight of the 12-cylinder engine is 96,000 pounds and the 16-cylinder engine is 122,000 pounds.



One of a new series of 4-cycle Supairthermal V-type engines is this 12-cylinder diesel, rated at 3,200 hp.

The engines consume liquid fuel, duafuel, or spark-fired gas. As a diesel, the engine burns a wide range of fuel and crude oils. For duafuel operation, the engine burns various types of gaseous fuels with only a small percentage of pilot oil to control combustion. In case of interruption in gas supply, the engine will automatically change to liquid fuel without affecting speed or load. As a spark-fired gas engine, it will burn natural gas, butane, propane, manufactured gas, and sewage gas using a dual-spark ignition system.

For further information write to the company, or use the Request Card that is bound in an page 18. Circle No. 259.

UNRWA Funds Go to Jordan Dam Project

A scheme providing for the construction of a dam 400 feet high across the Yarmuk River in the Jordan Valley, has been made possible by an agreement signed last March in Amman, capital of Jordan, by Anwar Nusseiby, Jordan's Minister of Reconstruction and Development, and Leslie J. Carter, Acting Director of the United Nations Relief and Works Agency self-support fund for Palestinian refugees. The dam will feed two power stations producing together 10,000 kilowatts and will irrigate 95,000 acres in the Jordan Valley below the confluence of the Yarmuk-Jordan Rivers and the Dead Sea.

The land to come under irrigation is the greater part of the 60-mile stretch of the Jordan Valley between the Lake of Galilee in the north and the Dead Sea in the south. Thousands of Arab refugees have been existing in this arid waste since their flight from Palestine in 1948 and though many have moved on to other parts of Jordan, roughly 76,000 are still in the valley. The project aims to rehabilitate 20,000 families by employing as many as are needed in the construction work and making farmland available when the irrigation scheme is completed.

Experts from all over the world are participating in the various economic, agricultural, and other surveys in progress. By the agreement signed in March the government of Jordan undertook to facilitate the completion of these surveys and to provide all information required. Aerial surveys of the Yarmuk and Jordan Valleys had already been completed when the agreement was signed; work was progressing on an access road for the transportation of heavy machinery to the construction area, and daily readings were being taken at a weir set up to measure the water discharge near the dam site. Recommendations have now been made for an anti-malaria program.

For the preliminary investigations $1,500,000 was made available jointly by UNRWA, the British loan, and Point Four. Pending the completion of technical surveys, UNRWA agreed to set aside $40,000,000 from its $200,000,000 refugee-self-support funds until the end of 1953 when the definite commitments of funds will take place. John B. Blandford Jr., former Director of UNRWA, said earlier this year that the Yarmuk project—the Agency's first large-scale undertaking—though estimated originally at $40,000,000, might well represent an investment approaching $60,000,000.

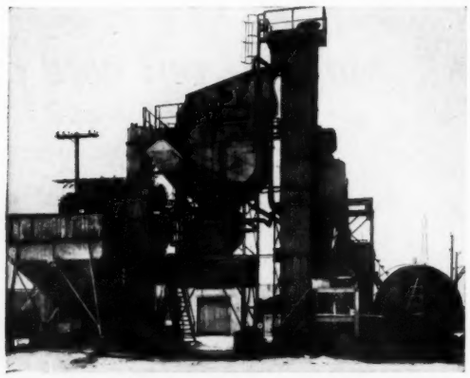
Striping Material

A new reflective striping material for highways and streets is announced by Minnesota Mining & Mfg. Co., 900 Fauquier St., St. Paul 6, Minn. The material has been developed for urban areas where fast-drying qualities are needed.

Drying time of the Beeline pavement marking has been reduced by using small beads and a new base said not to smear.

For further information write to the company, or use the Request Card at page 18. Circle No. 213.

Cummer Asphalt Plants and the World's Busiest Highways Have Grown Up Together



Put Cummer Plants to Work Building Your "Roads to Profit"

The stupendous, unceasing movement of American people and American goods is made possible by twin developments as closely related as two sides of a coin — the vast network of highways and automotive transportation. Cummer, which has been building fine asphalt plants since 1895, has been identified with this amazing growth and expansion from the very beginning.

Typical of dependable Cummer Asphalt Plants — famous for over half a century for profitable production — is the stationary model shown here owned and operated by Asphalt Paving Products Company, Inc., Detroit, Michigan. Designed for efficiency and ruggedly constructed, this Cummer plant consistently produces 80-125 tons per hour (based on 5% initial water content, dried to within ½ of 1% and heated to 350°-400° F.) This complete plant is equipped with dust elevator, washer, enclosed hot elevator. Electrically powered throughout, each unit is individually driven.

Cummer Plants Incorporate These Superior Features.

Mixing towers with vibrating screens and mixer.
Dust collector discharging reclaimed dust into hot elevator.
Two furnace combustion with low pressure burner equipment.
Cold storage bin and feeder.
Enclosed hot elevator.
Diesel or electric power.

CUMMER PLANTS—complete with all motor and starter switches—are available in sizes from 55 to 125 tons per hour. Send for your copy of the descriptive Cummer Catalog today.

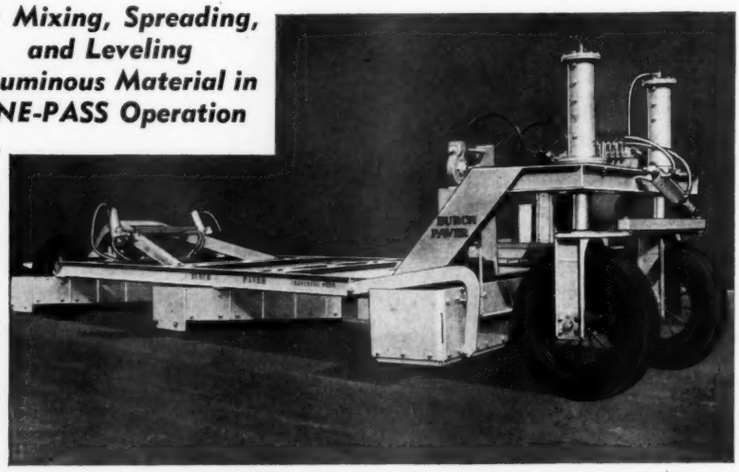
THE F. D. CUMMER & SON COMPANY

1827 East 18th Street — Pioneer Builders of Fine Asphalt Plants — Cleveland 14, Ohio

BURCH is the BEST BUY!

Model 12 PAVER and RESURFACER

for Mixing, Spreading, and Leveling Bituminous Material in ONE-PASS Operation



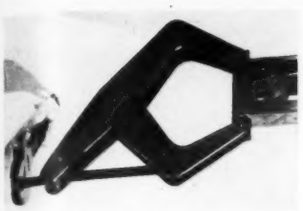
- Hydraulic steering on both front and rear wheels provides easy maneuvering.
- Entire frame hydraulically lifted for easy transportation.
- Machine is adjustable to conform to any grade or road contour.
- Material is rolled and mixed FOUR times before strikeoff blade acts on it.
- Dividing blade is hydraulically controlled to distribute material either to right or left for desired distribution.
- The Burch Model 12 is economical and easy to operate — does the job right.

FOR COMPLETE INFORMATION WRITE DEPT. C-63.

The BURCH Corporation

MANUFACTURERS OF EQUIPMENT FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND STREETS

CRESTLINE, OHIO, U.S.A.



A new adjustable hand clamp for milling, routing, and shaping work, said to be 65 per cent lighter than other types of clamps of comparable strength, is announced by Centinela Industrial Supply Co., 11930 Inglewood Ave., Hawthorne, Calif. For further data write to the company, or use the Request Card at page 18. Circle No. 328.

New Bonding Agent

A permanent bond can be made between plasters, cements, or concrete and almost any other surface by means of a new bonding material. Weldcrete can be applied over almost any surface, wet or dry, hot or cold, and, according to the manufacturer, it is unaffected by humidity. It can be used in temperatures ranging from minus 35 to 310 degrees F.

The compound is applied by brush or spray gun and covers 200 to 500 square feet per gallon. It dries in 40 minutes on porous material or in up to 2 hours on non-porous materials. It can be covered immediately or as long as 10 days after application. The manufacturer states that the bonding agent will not burn, deteriorate, lose its flexibility, or oxidize.

Other materials on which the compound can be used include steel, metal, tile, brick, stone, and plywood.

For further information write to the Larsen Products Corp., 4934 Elm St., Bethesda, Md., or use the Request Card at page 18. Circle No. 184.

Metal Hose Technical Data

Information on applications, dimensions, and temperature ranges of various types of metal and wire-braided hose is given in a new booklet from the Universal Metal Hose Co., 2133 S. Kedzie Ave., Chicago 23, Ill. Types of flexible metal hose illustrated and described include seamless, all-metal, flexible, pressure hose; interlocked suction, blower, and conveyor hose; and square-locked conduits and flexible spout tubing. The booklet lists high-pressure hydraulic hose; single and double wire-braided hose for high or low pressure; and others for special applications such as vibration elimination, and steam and gas stove connectors.

Couplings and assemblies are shown.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 207.

Folder on New Bulldozer

A new folder has been issued on the Baker 15X bulldozer. The unit has a moldboard 51 inches high that lifts 39½ inches above ground and bites 15½ inches deep. The dozer is mounted on an Allis-Chalmers HD-15 tractor with 109 drawbar hp.

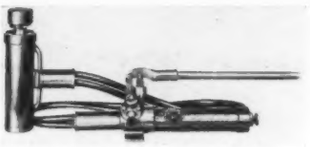
To obtain this literature write to Baker Mfg. Co., 2573 S. 10th St. at Stanford, Springfield, Ill., or use the Request Card at page 18. Circle No. 330.

A Curing Compound

A colorless membrane curing compound is offered by the Thompson Materials Corp., 303 Cortlandt St., Belleville 9, N. J.

According to the manufacturer, T. M. C. curing compound is applied in one coat by spray gun immediately after the concrete is placed and finished. The compound is said to seal in moisture during the curing period to produce a stronger concrete with improved wearing surface. It is transparent and leaves the surface of the concrete in its original condition of finish and color. It does not react with the concrete.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 331.



Push and Pull Jack

A new hydraulic jack will push up to 20 tons and pull up to 13½ tons. Turning a valve switches from pushing to pulling. The Hein-Werner J-20 jack is suitable for lifting and moving machinery, equipment, and structures; heavy-duty straightening and aligning; shoring operations; driving pilings, and testing structural strengths; and numerous other applications.

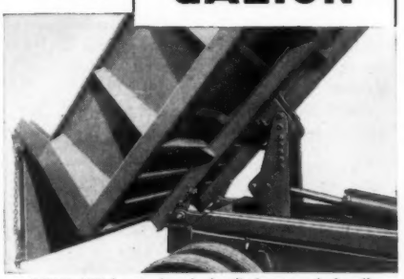
The jack's pump works in any position without becoming airbound. Other features are remote-control operation that protects the user and safety valves to prevent overloading. Attachments to adapt the jack to special applications are also available.

For further information write to Hein-Werner Corp., Waukesha, Wis., or use the Request Card at page 18. Circle No. 266.

Universal Atlas News

Raymond L. Walsh, Assistant Chief Engineer to Universal Atlas Cement Co., New York, N. Y., a subsidiary of U. S. Steel Corp., has been appointed Chief Engineer; W. M. Tomlinson, a former sales representative, becomes Assistant Sales Manager in Kansas City, Mo.; and James T. Maher, previously Chief Clerk, is now Assistant Sales Manager.

with **GALION** *no job is too BIG-or too TOUGH!*



MODEL 880 heavy duty hydraulic hoist easily handles 10½ to 15½ ton loads

● Throughout the world, construction men depend on Galion dump bodies and hydraulic hoists to handle their toughest jobs. They like the extra years of service built into every Galion... their lower maintenance and operating costs. And, they are enthusiastic about Galion's Fulcrumatic hoist action that equalizes mechanical pressure, lifts more, easier . . . eliminates strain on truck and body.

Galion manufactures a complete line of standard and heavy duty hoists and dump bodies to meet virtually every construction need. However, if you need extra heavy duty or specialized units, Galion will be glad to design and build them for you.

This is GALION'S Fulcrumatic action

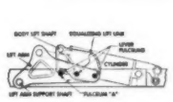


Figure 1—As the cylinder rod moves out, a powerful starting leverage is applied at Fulcrum A in a vertical direction...the body lifts smoothly and evenly.

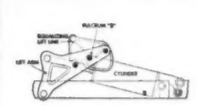


Figure 2—The body lifting effort is transferred to Fulcrum B as the rod continues outward...eliminating lift-shock and smoothing out lifting action.

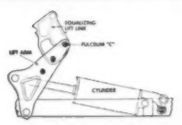


Figure 3—As the body approaches full dumping position the lifting job is transferred to Fulcrum C... maintaining uniform pump pressure and a smooth, steady dumping cycle to the very end.

MODEL 700 hydraulic hoist with Model 12-3 contractor's heavy duty body is ideal for 6½ to 8½ ton payloads

THE GALION ALLSTEEL BODY COMPANY • GALION, OHIO

IT'S SO EASY... TO MEASURE WITH Rolatape

MODEL 400 $54.50

For simplified measuring, walking or riding, Rolatape is your best bet! One man operation, releases second man for other important work. Recorded distance easily read at all times. Pays for itself immediately!

MODEL 400: For all roads and cross country measurement. Follows contours, holds true course. Registers over 18 miles. Weighs 5 lbs. Can be used from car.

MODEL 600: For rougher terrain. Ideal for Geophysical, Geological & preliminary survey, field inventories. Weighs 7 lbs.

MODEL 600 $64.50

PARTIAL LIST OF ROLATAPE USERS
Stone & Webster; Boling Air Force Base; Humble Oil Co.; Gulf Oil Co.; Pacific Gas & Electric; Standard Oil Co.; Illinois Power & Light; Portland General Electric; Carolina Power & Light; Colla Const. Co. of Conn.

INSPECTOR'S MODEL 200 $27.50 Complete with Carrying Case

For hard surface areas. Weighs 2¾ lbs.

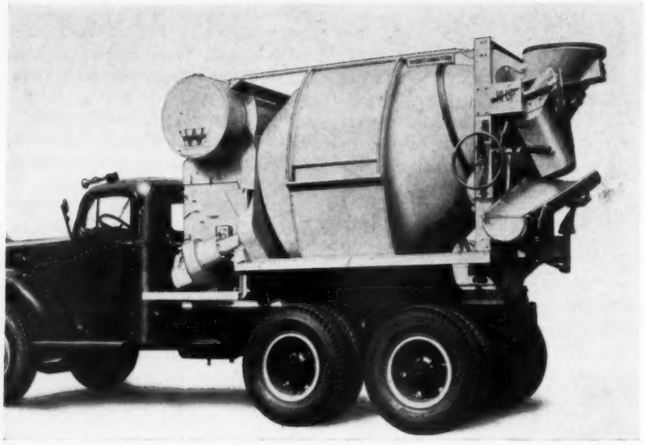
10 DAYS FREE TRIAL ON ANY MODEL

ACCURATE FAST SAVES MANPOWER

WRITE DEPT. CE

All prices F.O.B. Santa Monica, Cal.

Rolatape 1741 14th St., Santa Monica, Calif.

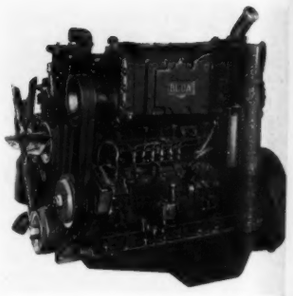


The new Worthington 4½-yard Model LC Hi-Up truck mixer has a top-loading hatch door, end-loading hopper, a 2-compartment mix and flush-water tank, side shields, and splash aprons. Approximate weight is 7,100 pounds. For further information write to the Worthington Corp., Construction Equipment Division, Plainfield, N. J., or use the Request Card at page 18. Circle No. 227.

Diesel Engine For Heavy Trucks

A new 165-hp diesel engine for heavy trucks and tractors hauling up to 60,000 pounds gvw is announced by The Buda Co., 154th St. & Commercial Ave., Harvey, Ill. The Model 6-DAS-516 is a 4-cycle 6-cylinder engine with a maximum torque of 402 foot pounds at 1,600 rpm. The engine is compact and light in weight and will go into any standard or C.O.E. truck or tractor chassis normally used for heavy hauling of inter-city or over-the-road freight.

The new diesel is a supercharged engine and has a displacement of 516 cubic inches, with a bore of 4 7/16 inches and a stroke of 5 9/16 inches. According to the manufacturer, the engine's wide speed range, in many cases permits the use of the same clutches, transmissions, and differentials that are normally used behind gasoline engines in those vehicles.



Its 47½-inch length is less than most of the gasoline engines used in trucks for which this engine has been designed. The over-all width is 32 11/16 inches. Over-all weight of the engine, including 12-volt electrical equipment and 7½-cubic-foot air compressor, is 1,825 pounds. Fan to flywheel weight of the engine, without the electrical equipment and compressor, is 1,625 pounds.

For further information write to the company, or use the Request Card at page 18. Circle No. 263.

Batch-Weighing Scales Have Electronic Controls

Electronic scales that automatically control the weighing of bulk products—dry or liquid—are shown in a folder from the Hardy Scales Co., 5701 Atlantic Ave., Maywood, Calif. The manufacturer points out that the scales can improve efficiency and also control the quality of the end product.

A variety of scales are made that will control the flow of one or more materials. Push-button controls are used to open and close a gate or valve; start and stop screw conveyors; and operate feeders, elevators, or whatever type conveyor is used to carry material to the weigh-hopper or tank scale.

The scales provide a printed detailed record.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 253.

Data on Water Repellent

The colorless silicone water repellent made by L. Sonneborn Sons, Inc., 404 4th Ave., New York, N. Y., is described in new literature from the company. The folder features the results of laboratory tests of the repellent, S-X. The tests measured water absorption in treated cement blocks under varying conditions of weather exposure. Coated bricks were tested for efflorescence.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 276.

USER RATES SCHRAMM AIR COMPRESSOR "TOPS"

After using a Schramm 210-c.f.m. Air Compressor for three years without a single repair to the compressor, a letter from Cyril B. Williams of the Williams Rock Company, Clinton, Mo., reported the purchase of another Schramm 210, saying that, "where plenty of air is needed," he recommended Schramm Compressors, "as I think they are tops!"

Here is shown the job being done by Schramm for Williams — furnishing air for drilling limestone ledge rock 14 ft. to 16 ft. in depth . . . the compressor operating 2 heavy-duty rock drills . . . one man operating both hammers. Result: 400 tons of crushed stone daily which, Williams continued, "means a lot of drilling!"

You, too, will find Schramm Air Compressors "Tops." For complete information on their many advantages, write us today.

SCHRAMM, INC.

The Compressor People

WEST CHESTER • PENNSYLVANIA

SELF-PRIMING CENTRIFUGAL PUMPS

RICE

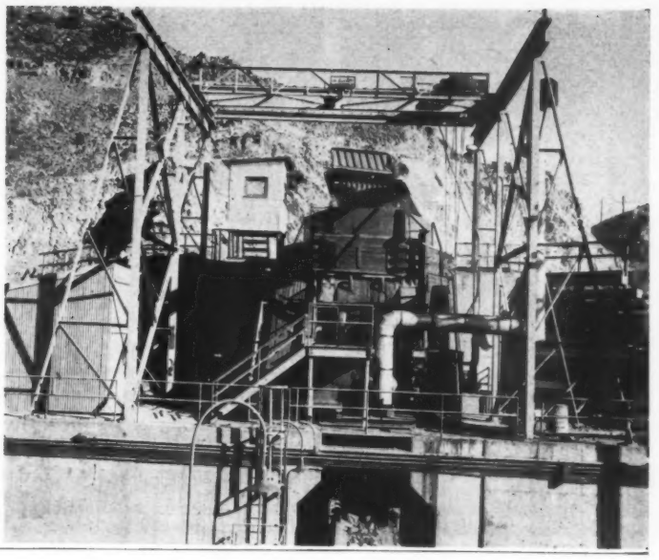
Engine belt and electric driven pumps with many new features to give you outstanding performance at low cost. A.G.C. rated. Write for special bulletins.

RICE PUMP & MACHINE CO.

220 N. 12th Avenue, Grafton, Wisconsin

Automatic Lubrication Replaces Hand Methods

Centralized Automatic Systems Being Installed on Many Types of Construction Equipment



This 66 x 84 Birdsboro crusher is serviced by a Farval enclosed-pressure lubricating system—representing an advance toward precise, automatic lubrication of construction machinery. *Ray Day Photo*

• THE oil can and the hand grease gun for the lubrication of construction machinery are things of the past. With equipment improved to stages of almost unbelievable efficiency, and with lubricants engineered to maintain that efficiency, the old hand methods of lubrication have become obsolete.

Where shop lubrication of equipment in the field is not practical, contractors have been turning to mobile service units. Keeping step with this demand, the manufacturers of lubrication equipment have produced better mobile units such as the Lincoln Lubrovan, Alemite Portable Service Station, etc.

The trend is definitely toward better, cleaner lubrication methods in the construction industry. Many well known contractors have long replaced antiquated methods of lubrication with modern mobile units.

Mobile service units not only bring the proper lubricants to the machine right on the job, but also help eliminate the human error. The mobile unit is usually manned by a specialist equipped with the proper charts and records as well as the know-how which enable him to get the right lubricant in the right place, in the right quantity, at the right time.

Typical Installations

There are growing indications that even this is not the ultimate. Automatic lubrication systems, successfully used in industrial applications, are being adapted to construction equipment. A typical installation is the Lincoln Centro-Matic lubricant-application system installed on a 5-yard Marion shovel in the quarry of a midwest cement manufacturer.

With this system it takes just 2 minutes to grease 78 bearings. Down time has been reduced from ½ hour to 2 minutes every 4-hour period. The entire unit is permanently installed inside the shovel cab and power comes from the same compressor that supplies air for the shovel controls.

(Continued on next page)

TWIN PRIME PUMPS

. . . Better performance

. . . Lower cost

DUAL VOLUTES, fast priming, non-clogging portable, long lasting centrifugal pumps. Distributors—write for attractive proposition.

OHLER MACHINERY CO.
WATERLOO IOWA

HERE ARE HELTZEL'S NEW *COMPLETELY AUTOMATIC ELECTRONICALLY CONTROLLED* BATCHING PLANTS . . .

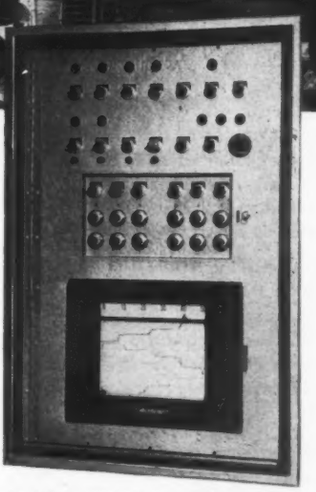
Two new Heltzel Batching Plants at work on the Ohio Turnpike. Built to conform with Ohio Turnpike Commission specifications, the Cement Plant (left) has a 400 bbl. capacity with a 375 bbl. recirculator. Three-compartment aggregate Plant (right) holds up to 200 tons.

Here's real news for contractors who want batching equipment that will do more with less labor. The new electronically actuated fully automatic Heltzel plants designed for road builders, truck mixer and central mix operations.

Push button operated by one man these job-tested plants will batch up to 250 yards of perfectly proportioned batches per hour . . . with 29 separate batch combinations immediately available to the operator. Each batch, time and amount electrically recorded for easy daily tabulation.

Portable, the plants were designed for quick set-up and knock-down, easy over-the-road handling. For permanent installation Heltzel's combination cement-aggregate plant would be used instead of two separate plants.

For additional information write or call **The Heltzel Steel Form and Iron Co., Warren, Ohio,** and ask for Bulletin O-21.



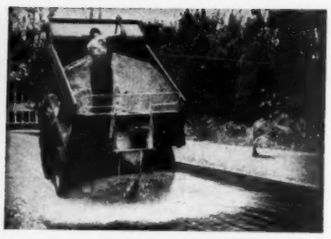
Push button panel with recording equipment. Each of the 29 batch selection buttons controls a completely different mix. Panel will be wired to suit your individual requirements. Recording equipment optional.

— Naturally It's A Heltzel Flex-Plane Product —

MODEL R HI-WAY SPREADER

Here is the Spreader that *outperforms all others*, as proved by actual field tests and on-the-job figures!

Use it for any type of aggregate from fine sand to crushed stone. It will spread forward or reverse, with control of material flow. By using baffles, you can control the width of the spread from one foot to the maximum. You'll be amazed at *Model R's* record of operational economy. Available in sizes from 8' through 13'.



MODEL DD TAILGATE SPREADER

Here is the economical *all-purpose, all-weather* Spreader—used in the summer for dust control and for seal coating, and in the winter for spreading sand, cinders or rock salt on icy pavements.

Model DD fits any standard dump truck body and can be attached or detached in one minute. It gives a uniform spread 4 to 60 feet wide, at 1 to 35 miles per hour. *Model DD* will give you years of economical, trouble-free service.

Sold by leading distributors throughout the U.S., Canada and many foreign countries

HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA, U. S. A.

MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS

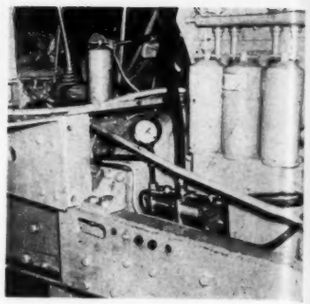
Automatic Lubrication

(Continued from preceding page)

Another example is an Alemite Accumeter, installed on a Euclid rear-dump truck at a mining operation in Arkansas, which once a day lubricates 40 bearings on the machine in 15 minutes. Other similar units require as long as 1½ hours for lubrication by other methods.

Automatic lubricators have also been installed on a variety of machines ranging in size from a Caterpillar D8 tractor to a giant 50-yard Marion stripping shovel.

In parts of the country where dust and wind are common operating problems, a trend away from old-style lubricating methods has been plain to see. Even though centralized lubrication has not yet been adopted to any appreciable degree, the search for some better and surer method of equipment lubrication is becoming more and more apparent.



Pump installation for the Lincoln Centro-Matic lubrication system on a Caterpillar tractor. The normal operation of the hydraulically-powered dozer blade automatically lubricates 24 bearings.

Iron Mining

A start in the direction of centralized lubrication has been made especially by contractors engaged in other enterprises. One good example of the trend is at Eagle Mountain, Calif., where Kaiser Steel Co. is currently producing about 6,500 tons of iron ore per week, to feed its blast furnaces at Fontana, Calif.

With years of experience in contracting on such big jobs as Boulder Dam, Grand Coulee, and others, Kaiser's management has placed such typical excavating and hauling units at Eagle Mountain as 18 Euclids, 3 Macks, 3 Bucyrus-Erie 54-B shovels, a 120-B, a 150-B, a 21-B crane, and even a small Hydrocrane. Recently installed to reduce the raw material to crushed ore was one of the largest deep-frame jaw crushers in the country: a 66 x 84 Birdsboro powered by a Westinghouse 300-hp motor.

Dissatisfied with hit-or-miss lubrication and hounded by wind, dust, and high summer temperatures, Kaiser has recently taken steps to modernize its equipment-lubrication methods. Under construction now is an enclosed shop with drive-through doors where Euclids can be serviced out of the wind and dust. Although centralized lubrication will not be used, Kaiser is changing from grease bucket maintenance to bulk oil and lubricants in clean, dust-free pressure containers. Grease men are being specially instructed in the importance of giving each fitting the right amount of lubricant, and no more.

On the big Birdsboro crusher, an even better refinement has been installed as a permanent part of the setup. The crusher is equipped with a totally enclosed Farval lubrication system, and as secondary insurance that its reservoir will never run dry, an Alemite pressure tank has been installed in a covered shed so that the Farval reservoir can be refilled while the crusher is in operation. This system delivers positive and proper lubrication to the key unit at Eagle Mountain. In every instance of equipment lubrication, the policy is to maintain equipment properly with the least amount of down time.

Automatic Systems

The chief element of automatic lubricating systems is a dispensing valve that uses a simple piston-displacement principle of measurement to control delivery of the lubricant to the bearing. A pumping unit delivers lubricant from a reservoir,

Fewer Shifts for Faster Trips

Take a ride in any mechanical-drive off-highway truck. Watch the driver work all the way as he double-clutches, slows down, shifts and speeds up over and over again. He'll be using up to ten transmission speeds to make his run and it'll be tough going all the way.

Now take that same trip in a truck that has an Allison TORQMATIC DRIVE. The driver's left foot will be idle because there's no clutch pedal to push. Notice how he just flicks a lever to shift *without slowing down*. And notice that with the flexibility of the torque converter he needs only three forward speeds to adequately handle all loads and grades. He'll be making fewer shifts and be back for another load a lot faster. Faster trips mean more pay loads per day.

Matched units built by one manufacturer, Allison TORQMATIC DRIVES cut operating and maintenance costs by absorbing harmful shock loads. Ask your equipment manufacturer, dealer or write:

ALLISON *Division of* GENERAL MOTORS
Box 894CC, Indianapolis 6, Indiana

ALLISON TORQMATIC DRIVES

Unbeatable Team for Maximum Operating Economy

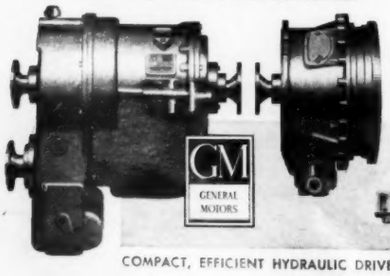
*Quick-shifts at full throttle with fingertip hydraulic control.

*Holds power to load at all times — no clutch pedal to push — no gearshift guess.

*Cuts maintenance cost by absorbing shock — eliminates engine lugging — prolongs equipment life.

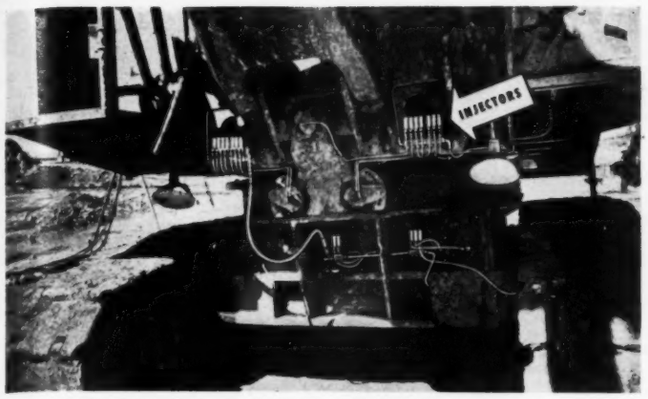
*Only torque converter-transmission team designed to work together as a unit and built by one manufacturer.

MATCHED UNITS BUILT BY ONE MANUFACTURER



Allison TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES * TRUCKS * TRACTORS * SHOVELS * SCRAPERS * DRILLING RIGS



Lubricant-feeder lines of the Centro-Matic system run to the hook-roller, hook-roller frames, rollers, crawler-drive sprockets, and many other bearings on a Marion shovel.

forcing it through a supply line to injector valves mounted on the machine in manifolds. From the injectors, rigid or flexible feeder lines extend to every point to be lubricated. Each injector has a visible indicator and an external manual adjustment which is preset to deliver the proper quantity of lubricant at the time the system is cycled.

Models vary according to the means of timing. A fully automatic unit has a time-clock control. A second kind operates automatically once a control lever is actuated. There is also a model which depends on manual power and is manually timed.

A unit commonly used on construction machinery is connected to the machine's hydraulic system. The pump and lubricant reservoir are mounted directly on the unit to be serviced. One such installation on a Caterpillar tractor lubricates 24 bearings by the normal operation of the dozer blade. The pressure that moves the blade also activates the lubricating system's pump. After a number of successive operations of the pump, enough lubricant pressure is developed in the system's supply lines to send a measured shot of oil or lubricant through the injectors to each bearing.

Economics

On construction equipment the lubricating system's pipes and injectors must withstand vibrations and external abuse and still stay in working order. They must also operate accurately and consistently in all kinds of climatic and atmospheric conditions. When centralized systems are proved to have this dependability, the answer to the lubrication problem becomes a matter of economics.

Like everyone else, the contractors are bound by laws of economics, and seem to be caught in the middle of a tough situation. If they trust lubrications problems to old methods and expensive labor, costs go sky-high and there is considerable equipment down time. On the other hand, centralized lubrication systems seem too costly to buy and install on most construction equipment. Contractors are making the best compromise they can until the day when centralized systems will be standard equipment on construction machinery.

Undoubtedly that day is coming. Lubrication research men are currently working with manufacturers of construction equipment to see whether central lubrication systems can be built and installed permanently at low first cost to the purchaser. If they succeed, construction equipment may be expected to give many additional hours of profitable operation.

New Cartwright Distributor Bars Give Balanced Pressure With No Drip

SD Model at right has been designed particularly for city use and to meet a limited budget without sacrificing performance.

Shown at left is a 1250-gallon Precision Distributor. Write for bulletin describing this most advanced equipment and the new Cartwright Circulating No Drip balanced pressure spray bars.

GENERAL STEEL TANK COMPANY

P. O. Box 552 — Birmingham 1, Alabama

Paving the way for savings

● When you use asphalt construction or resurfacing for city street or highway, you're paving the way for real savings in time and money. When you use Standard Oil asphalt you're gaining even greater road-building economy.

You save time because easier laying of asphalt, use of lighter and faster equipment, and the rapid setting of asphalt all help to speed road construction.

You save money because faster paving means fewer man-hours and lower labor costs. Local aggregate can be used to keep material and material handling expenses at a minimum. The durability of asphalt paving brings savings in the long run. Asphalt and heavy aggregate, mixed, make strong road foundations. Top courses of asphalt, stone, and sand present long-wearing, waterproof surfaces. Maintenance, when necessary, takes a minimum of time, labor, and materials.

You add further to these savings by using Standard Oil asphalt. With five asphalt-producing refineries located throughout the Midwest, Standard makes the haul to your site a short one. Prompt, reliable shipments eliminate work delays. Freight costs are at a minimum. A Standard Asphalt Representative will be glad to work with you on your job needs. For his services, write: Standard Oil Company (Ind.), 910 S. Michigan Avenue, Chicago 80, Illinois.

STANDARD OIL ASPHALT

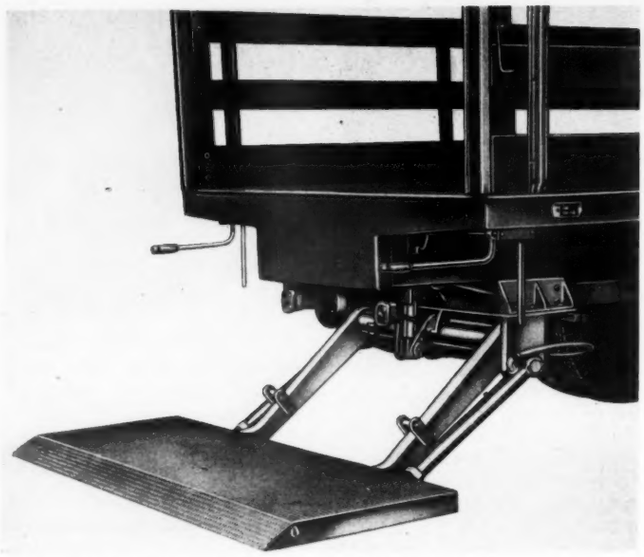
STANDARD OIL COMPANY STANDARD *(Indiana)*

Welding Electrodes

The Murex line of stainless steel arc-welding electrodes is now packed in hermetically sealed metal cans. The smaller diameters come in 5-pound containers and the larger diameters in 10-pound containers. Air-tight packing is intended to eliminate any possibility of moisture pick-up by the electrode coatings from the time the electrodes are made until the cans are opened for use.

The company's line of stainless-steel electrodes includes lime-coated, titania-coated, and AC-DC rods in all standard analyses as well as in a wide variety of less commonly used grades.

For further information write to the Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y., or use the Request Card at page 18. Circle No. 285.



The improved Hydrogate made by the Marion Metal Products Co.

Hydraulic Tailgate Has Improved Locking

Improvements in the Marion Hydrogate, a power tailgate for trucks, include a double locking device. The gate is also said to lock more securely than before because of the relocation of locking hooks. The manufacturer states that locking and lifting controls are now coordinated so that it is not necessary for the operator to dismount in order to unlock the gate. The sealing around the main lift-cylinder-head, piston rod, and closing cylinders has also been improved.

The Hydrogate is a complete unit that comes ready for mounting on any truck without special tools. The self-contained hydraulic unit simplifies installation. The hydraulically operated gate lifts, lowers, and closes from either side. The locking tailgate lowers to ground level or stops and holds at any height. The platform, constructed of non-tread plate, handles up to 2,000 pounds.

For further information write to the Marion Metal Products Co., Marion, Ohio, or use the Request Card at page 18. Circle No. 220.

Pneumatic Conveyor

A pneumatic conveyor system that carries substances such as cement and rock is shown in a booklet from the Convair Inc., 4156 Library Road, Pittsburgh 34, Pa. The material is conveyed into a cyclone unit from which it falls by gravity into an activator below. Air from a blower entrains the material falling out of the activator and carries it in a fluid mass to the storage bin. Filters above the cyclone and storage bin make the system dust-free.

The booklet illustrates variations in the system which can be made to fit requirements of the job, such as unloading boxcars and hoppers and conveying broken and crushed products. A portable system is shown carrying gravel from yard level to the roof of a building.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 186.

Symons Awards Contract

Symons Clamp & Mfg. Co., Chicago, Ill., has awarded a contract to Rock Island Lumber Co., a subsidiary of Weyerhaeuser Timber Co., to manufacture its patented plywood panels used in the construction of concrete walls.

The increasing demand for the Symons system of concrete form construction, which enables plywood panels to be re-used, has necessitated the employment of an outside manufacturer. An important advantage of the new arrangement is that shipping costs for forms will be greatly reduced throughout the midwest and southwest, and shipment to contractors facilitated.

It is expected that manufacturing will eventually be done at Albert Lea, Minn., but for the time being, the forms will be made at Rock Island's plant in Independence, Kans.

Worthington Rotary Blitzer in action on expressway shoulder. High-speed rotary cutting units slice through anything from grass to tall weeds.

new WORTHINGTON ROTARY BLITZER

DOUBLES MOWING VOLUME

The new Worthington 3-gang Rotary Mower means *extra power* for faster, better mowing. Each of the big, rugged Worthington cutting units is independently powered by a heavy-duty 13.3 hp. Wisconsin engine. This means adequate cutting power at all times regardless of density of growth. Towing vehicle can travel at the most desirable speed consistent with density of growth and ground contour.

Speeds Mowing of Shoulders, Center Sections

With its 17-ft. swath, the Worthington Rotary Blitzer cuts 10 acres per hour at a mowing speed of 5 mph. —80 acres per eight-hour day. Power take-off mowers operating at the same speed cut only 40 percent of this volume — sickle bars only 20 percent!

Name Your Hauling Unit

Jeep, truck, small tractor—any one can pull the Rotary Blitzer. No power take-off to restrict type of vehicle, turning radius, cutting speed, etc.

Get the full details on this fast-cutting, cost-cutting mower. Send the coupon now.

WORTHINGTON MOWER COMPANY
STROUDSBURG, PENNSYLVANIA

WORTHINGTON MOWER COMPANY
Stroudsburg, Pennsylvania

Gentlemen: Please send full details about your Rotary Blitzer.

Name.....

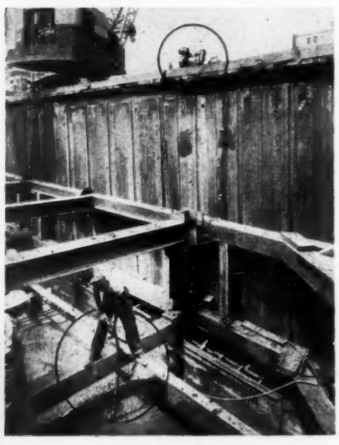
Title.....

Street or Box No.....

City.....

State.....

The Tough Jobs— CALL FOR Maginniss HI-LECTRIC



CONCRETE VIBRATORS

This is a real glutton for concrete placement jobs. The Maginniss keeps the concrete rolling fast, your operators fresh and alert, production and profits up. It is one man operated, has no flexible shafts. Electric motor is in the vibrator head.

Write and get complete information today.

Maginniss POWER TOOL CO.
MANSFIELD, OHIO

Ask the man behind the gun . . .

White gives you everything you want in an engineer's transit

Shown, model 7014 with "A" standard. "U" type also available. $575.00* complete with tripod case and field equipment.

WHY are more and more engineers and builders choosing White Engineers' Transits? Basically, the reason is simple: White transits are designed and built for the man in the field. They incorporate all the work-saving, accuracy-boosting features . . . the rugged construction . . . the simplified quality components that you want. In addition, you get coated optics, covered leveling screws and internal focusing Telescope. Wide frame tripod is optional.

YOUR CHOICE OF THREE RETICULES AS SHOWN BELOW —

Fig. I Cross hair arrangement for our standard levels.

Fig. II Stadia hair arrangement for our standard transits.

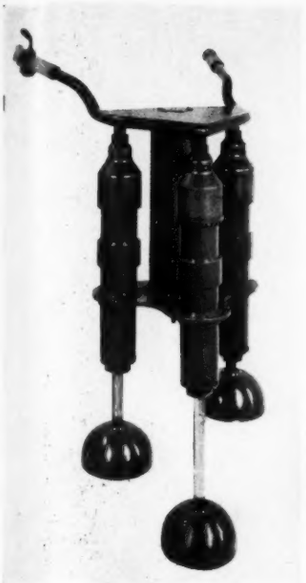
Fig. III Special stadia hair arrangement, furnished upon request.

To get the details on the complete White line of instruments for Engineers, Surveyors and Builders, write for Bulletin 1053. DAVID WHITE COMPANY, 313 W. Court Street, Milwaukee 12, Wisconsin.

DAVID WHITE COMPANY

We offer the most expert REPAIR SERVICE on all makes, all types of instruments

*Prices subject to change without notice.



Triple Backfill Tamper

A new triple-backfill tamper model is announced by the Gunderson-Taylor Machinery Co., 988 Cherokee St., Denver, Colo. The Super Triplex Model GT-4 is said to be 20 to 40 per cent faster than the standard model, and to have a 40-per-cent heavier impact.

The new unit has heavier pistons and weighs 45 pounds more than the earlier model. Its effective compaction area is 90 to 100 square inches. The unit compacts to the same density as the standard model, with substantially higher lifts.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 288.

Safety Awards Presented

The National Constructors Association, whose membership is composed of leading engineering and construction companies specializing in design and construction of chemical plants, steel mills, and oil refineries, has cited eight member companies for outstanding safety records in 1952.

The safety awards are part of a continuing, year-round "safety engineering" program launched by the National Constructors Association to reduce the severity and frequency of accidents in the construction industry.

Winners of the awards were, Bechtel Corp., San Francisco, Calif.; H. K. Ferguson Co., Cleveland, Ohio; Fluor Corp., Ltd., Los Angeles, Calif.; Lummus Co., New York, N. Y.; Arthur G. McKee & Co., Cleveland, Ohio; Procon, Inc., Chicago, Ill.; Rust Engineering Co., Pittsburgh, Pa.; and Stone & Webster Engineering Corp., Badger Process Division, Boston, Mass.

Mains Joins Heil Co.

John T. Mains was named Sales Representative for Heil road machinery, it has been announced by the manufacturer, The Heil Co., Milwaukee 1, Wis. Mr. Mains' office is in the Colorado Bldg., Room 625, Denver, Colo., and covers the district including Colorado, Utah, Wyoming, Montana, and southeastern Idaho.

Westinghouse Acquisition

R. G. LeTourneau, Inc., Peoria, Ill., a pioneer and recognized leader in the earth-moving equipment industry, has recently been purchased by Westinghouse Air Brake Co., Wilmerding, Pa. Acquisition includes LeTourneau's earth-moving, tractor, and related business; its sales and distribution organization; the Peoria, Ill., and the Toccoa, Ga., plants. LeTourneau Co., however, will retain and continue to operate its Vicksburg, Miss., and Longview, Texas, plants, where special products for the U. S. government will be produced along with land-clearing equipment, cranes, and other equipment not related to earth-moving.

R. G. LeTourneau, former President of the purchased firm, will continue research in the earth-moving equipment field for the new owners.

Westinghouse, according to Edward O. Boshell, President and Chairman, paid $26,300,000 in cash for the pioneer earth-moving firm which now becomes LeTourneau-Westinghouse.

Trailers and Crane-Mounts

Low-bed trailers, semi-dumps, and mobile crane-mounts are shown in a catalog from Talbert Construction Equipment Co., 7950 W. 47th St., Lyons, Ill.

The chief feature stressed in the booklet is that basic component parts of the trailers can be interchanged to convert the trailers to specialized hauling problems. The trailers may be had with a removable gooseneck, fixed or removable rear axles, or with a removable third axle. Decks may be of the standard flat, raised-center, drop side, or beam-types. The booklet shows trailers with 10 to 100-ton capacities. The dump semi-trailers fit 4 and 6-wheel tractors.

The company also offers crane-mounts in 10 to 100-ton capacities.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 273.

Loading sand on construction job.

Loading rock in Eastern quarry.

PRODUCTION UP COSTS DOWN

Tough loading jobs that incorporate loading of sand, rock, frozen ground, narrow passage ways, long hauls to discharge or any combination of disagreeable and hard to manage operations are easy for an Eimco.

These heavy-duty machines are at home in a rock pile — they'll load big or small trucks and operate in a space where no tractor can turn around.

Write for information on Eimcos, how they can load for you at unusually low cost and at a rate of 250 to 350 tons per hour.

You Can't beat an Eimco

EIMCO A456

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES — SALT LAKE CITY 10, UTAH, U. S. A.

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NEW YORK, 51-52 SOUTH STREET • CHICAGO, 3319 SOUTH WALLACE STREET
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EL PASO, TEXAS, MILLS BUILDING • BERKELEY, CALIF., 637 CEDAR STREET
KELLOGG, IDAHO, 307 DIVISION ST. • LONDON W. 1, ENGLAND, 190 PICCADILLY

IN FRANCE: SOCIETE EIMCO, PARIS, FRANCE
IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
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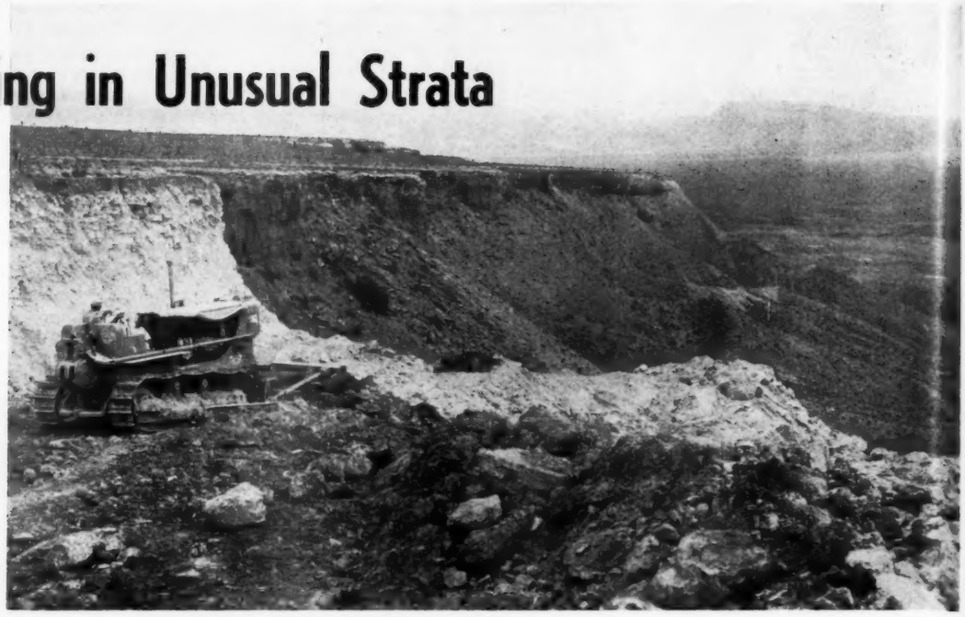
Construction job in frozen ground.

Cap-Rock Blasting in Unusual Strata



A Caterpillar D8 dozer starts to break down the blasted edge and make a hauling ramp toward lower country. *Ray Day Photo*

• IMAGINE trying to crack a walnut against a sheet of sponge rubber.

It's hardly more difficult than one of the most unusual and interesting blasting problems the Nevada Highway Department has ever handed to a contractor. Isbell Construction Co. of Reno made the $440,000 low bid which landed the hot potato in its lap, and because the company worked out the proper solution early in the game, the job now promises to be a good one.

The problem consists of taking U. S. 91 down the sheer 100-foot edge of an escarpment into a deep valley along the right bank of the Virgin River, to create a new alignment for 2.9 more miles of the important highway between Las Vegas, Nev., and St. George, Utah. The edge of the entire escarpment is a 20-foot cap rock of some of the hardest cemented conglomerate in the state, supported by a 10-foot layer of lime-rich caliche. Directly underneath that is a sand cushion, which has such an excellent tendency to

"She'll be coming 'round the mountain"

And on this particular mountain, in beautiful New England (Vermont to be explicit), she'll be coming 'round the mountain on a safe, smooth, resilient road—mixed and laid by a Moto-Paver. The upper illustration shows a Moto-Paver, owned by the Lambert Construction Co. of White River Junction, laying 2½" of bituminous concrete to 22 foot width for the Vermont State Highway Department.

Moto-Paver does the complete mixing and laying job—in one continuous operation. It uses beach sand, gravel, crushed stone or slag aggregates, and tars, cutback asphalts, road oils, emulsions or other bituminous materials. Road speeds up to 25 mph make possible quick moves from job to job.

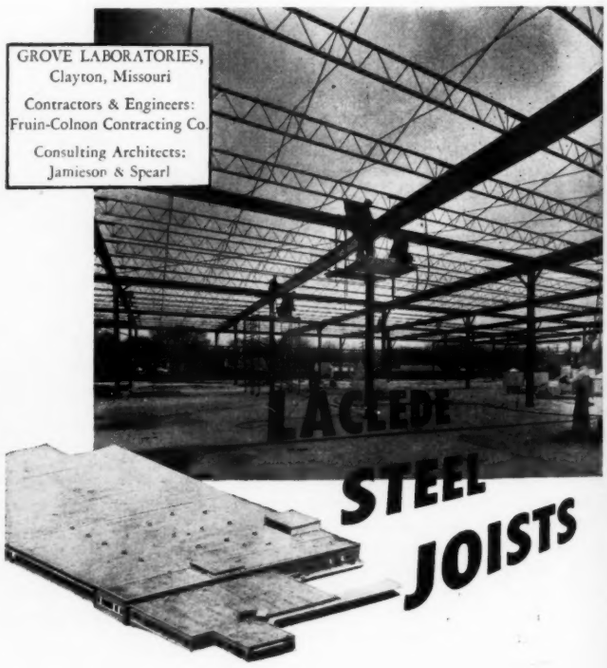
For specifications and complete information on the Moto-Paver or any other type of asphalt plant, see your local H & B distributor or write for Bulletin MP 49.

H & B ESTABLISHED 1887

HETHERINGTON & BERNER INC.

Engineers—Manufacturers

731 Kentucky Avenue — Indianapolis 7, Indiana



for FRAMING LARGE AREAS ECONOMICALLY... QUICKLY

Specify These Laclede Products: Welded Wire Fabric • Form & Tie Wire • Multi-Rib Reinforcing Bars • Joists • Corrugated Steel Centering • Spirals • Conduit • Steel Pipe • Electrical Weld & Gas Weld Tubing

LACLEDE — Producers of Construction Steel

LACLEDE STEEL COMPANY St. Louis, Mo.

cushion a blast and nullify explosives that ordinary powdermen tear their hair after the first few bad shots.

Nevada's locating engineers, pressured by increasing fast traffic and accidents along the winding old section, backed off and practically took a running leap off the cliff. They came up with a beautiful alignment, but they certainly had to create a problem for somebody to get down off the escarpment. When Isbell gets a roadway path blown out through the job, the new highway will dive straight off the 100-foot cliff by means of a deep cut and a deep fill. It will hug the lower edge of the cliff with a high-speed, gentle, 5,000-foot-radius curve, which will carry several thousand feet to the point of the deep basin. At that point a 5,000-foot-radius reverse curve becomes part of the alignment, terminating in a tangent and other sweeping curves to carry the highway down to easier country.

There are approximately 400,000 cubic yards in the grading portion of the contract, and 80 per cent is in rock. The big cut at the escarpment contains about 250,000 cubic yards, and will furnish much of the roadway-embankment material necessary to drop the highway down the mountain on its designed 5.33 per cent grade.

"Impossible" Rock Removal

"It's impossible", said more than

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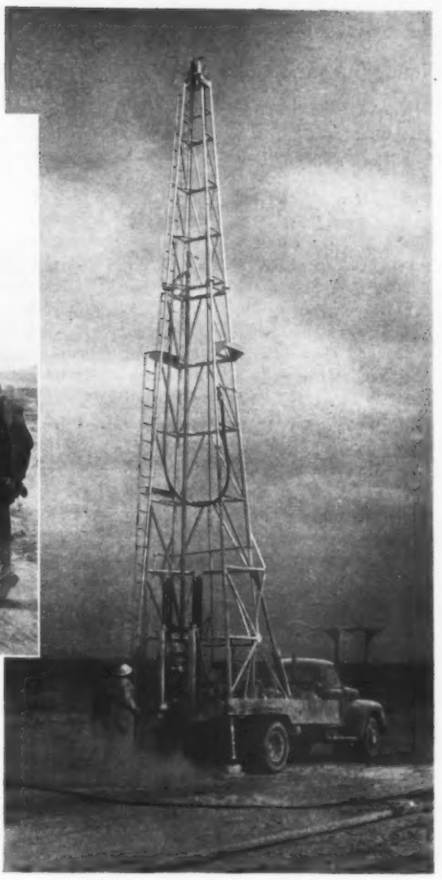


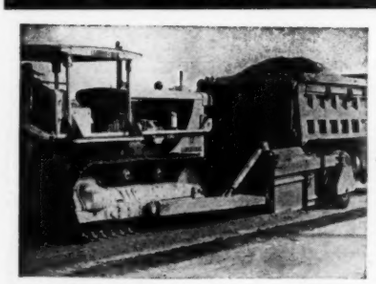
Above, the flat cap rock on top of Mormon Mesa makes an excellent location setup for the Thor wagon drill (foreground), Joy air-blast rotary, and Ingersoll-Rand Gyro-Flo compressor. Right, the Joy rotary drill accounted for as much as 600 feet of 5-inch hole per 8-hour shift.

Ray Day Photo

BUILD ROADS, TURNPIKES, and RUNWAYS with a . . .

JERSEY SPREADER

JERSEY SPREADER



Laying gravel sub-grade in preparation for concrete . . . Note how spreader is attached to side beams of tractor.

It's the newest, fastest and most profitable method to accurately spread broken stone, railroad ballast, crushed gravel, mine tailings, bank run gravel and a variety of other non-bulking material! . . . The Jersey Spreader has set records for accurate, low-cost work on many big airport and Turnpike jobs. Can replace 2 big motor graders yet costs less than $3,000.!

A Jersey Spreader easily handles up to 20 tons per min., ¾ in. thru normal macadam range stone in 1 to 12 in. depths, 10 to 13 ft. widths. Mounts on dozer push beams of heavy tractors, trucks feed directly into hopper.

Laying 2½" stone at large, metropolitan airport. One Jersey Spreader used to lay base for entire job. Any size truck can be used.

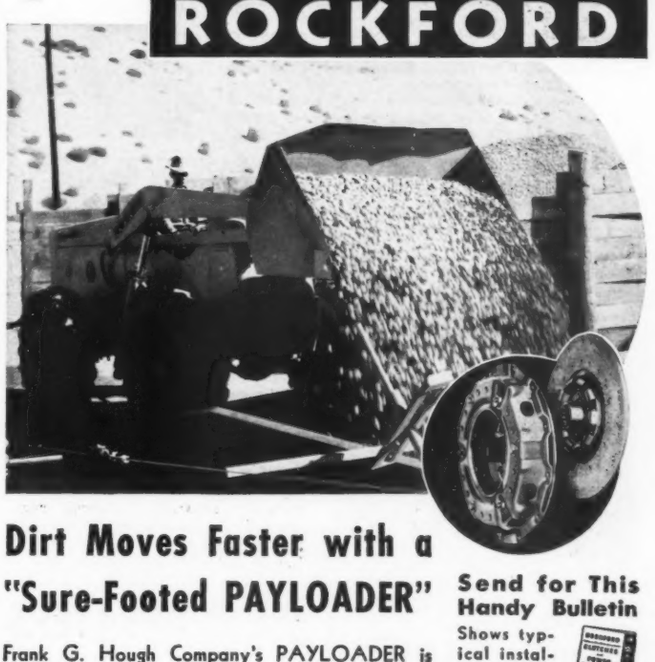
Write or wire for illustrated catalog showing complete details

TRACTOR SPREADER CO.

HASBROUCK HEIGHTS, N. J.

MANUFACTURER OF THE . . . JERSEY SPREADER

CLUTCHES by ROCKFORD



Dirt Moves Faster with a "Sure-Footed PAYLOADER"

Frank G. Hough Company's PAYLOADER is noted for it's traction, flotation and mobility under heavy loads in sand, snow, gravel or mud. ROCKFORD CLUTCHES provide positive power transmission control in this rough, heavy-duty service. Let ROCKFORD clutch engineers help your designers develop controls suitable for the most rugged going *your* product must meet.

Send for This Handy Bulletin

Shows typical installations of ROCKFORD CLUTCHES and POWER TAKE-OFFS. Contains diagrams of unique applications. Furnishes capacity tables, dimensions and complete specifications.

ROCKFORD CLUTCH DIVISION BORG-WARNER

314 Catherine Street, Rockford, Illinois, U.S.A.

Cap-Rock Blasting In Unusual Strata

(Continued from preceding page)

one bidder who looked at the site. Others were skeptical; still others with experience in conglomerate took a long second look and placed careful bids. Isbell Construction Co. has a fine reputation in rock removal, but even in placing a bid, Isbell's top officials realized the job could be extremely tough unless the cap rock was handled exactly right.

The job plan called for the initial deep cut at the edge of the escarpment to be blown loose and started downhill by U-type dozers on D8's. As these machines extended a hauling ramp on a steep downgrade, more blasting would be done and a power shovel and trucks could be brought in. In the sand cuts near the lower end of the job, tractor equipment would work.

The first work, therefore, was drilling and shooting. A new-type machine—a Joy air-blast rotary drill mounted on a Ford F-8 truck—was brought in. Along with it came one Thor wagon drill, a pair of Cleveland wagon drills, and an Ingersoll-Rand Gyro-Flo 600-cfm compressor.

The first shot was an experiment, and it fell short of expectations. Refinements were made on the second shot to correct things. After it had been pulled, project officials knew they had the secret. The cap rock could be removed only by shooting it much heavier than ordinary in the center of the cut, only by using delays judiciously, and only by holding secondary shooting to an absolute minimum. The drill and blast pattern now follows these general objectives and is working successfully. Here's how it's done:

The standard hole pattern calls for a 24-foot grid pattern of 4¾ to 5-inch holes drilled by the Joy rotary drill, with one rotary-drilled 5-inch hole in the center of each grid. These holes go down through the 10 to 20-foot cap rock and the 10 feet of caliche underneath, often reaching depths as great as 33 feet.

At the halfway intervals between each of these large-diameter holes, a 12-foot wagon-drill hole 2¾ inches in diameter is sunk. It is bottomed to at least 2½ inches in diameter. This standard pattern is repeated over the full width of the cut, which reaches 140 feet in width at the escarpment edge. In addition, a row of wagon-drill holes is sunk 5 feet back of the shoulder line 10 feet apart. Five-inch rotary holes are sunk along the 15-foot berm which underlies the first ¼ to 1 slope, and also at the toe of a 1 to 1 slope just below the berm.

The center row of rotary holes is sprung once with about 12 sticks of Hercules powder, and the center row of holes is then heavily loaded with at least 1 pound of Hercomite bag powder per cubic yard. Each of these holes is also charged with 9 sticks of dynamite, the center stick containing an electric blasting cap. Instantaneous caps are used for the center grid to blow this material to bits, opening up a path for No. 1, 2, 3, and 4 delays to kick to the center from each side.

The grids to each side of center are loaded with progressively diminishing charges of powder, dropping down to about ¼ pound per cubic yard along the slope lines. The powder factor for efficient shooting averages 0.65 pound per cubic yard over the whole cut. All holes with the exception of the center grid are column-loaded. The wagon-drill holes are charged with 3 sticks of dynamite and an electric blasting cap.

A parallel hookup for exploding the shots was abandoned after the first two blasts, and a series in parallel method was adopted. So far, the biggest powder charge set off has been 7,500 pounds at once. A 7½-kw light plant is being used to touch off the charges.

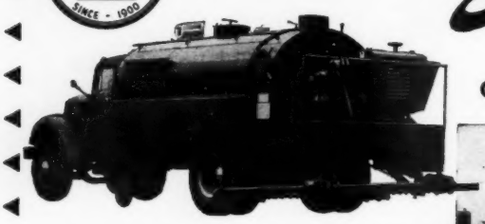
So far as drill performance is concerned, the use of the truck-mounted Joy rotary rig has drawn visits from interested contractors for miles around. When the machine was first brought on the job, it was scheduled for 300 feet of drilling per 8-hour shift, with Hughes oilwell-type bits. A changeover to Varel bits—they are oilfield bits made in Dallas, Texas—boosted drill footage to 650 feet a shift for this machine. Bits generally give about 1,000 feet of drilling, even in the cemented conglomerate, and sometimes even then they can be rehabilitated for

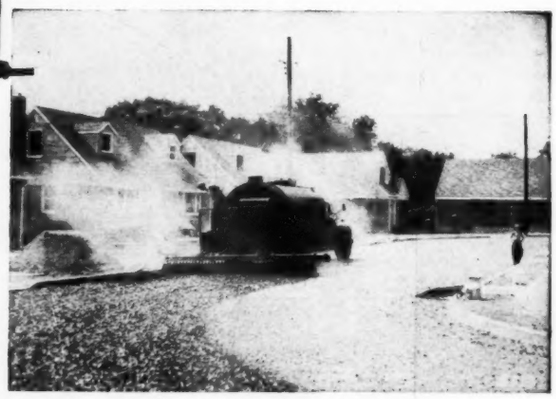
LB LITTLEFORD "Spray-Master"

BLACK TOP ROAD MAINTENANCE EQUIPMENT SINCE - 1900

BITUMINOUS DISTRIBUTOR

Gives Low Cost • Mix in Place • Seal Coat Jobs





Here's the Bituminous Spraying unit that will handle Asphalt, Tar, Emulsions, Cut-Back and Road Oils for any road maintenance or construction work. It's engineered to operate with the minimum of cost and designed to eliminate valves, pipe lines and controls, making it simple to operate.

Spray Bars operate up to 24 ft. in width, both the Standard Suck-Back Bar or the Full Circulating Vacuum Flow Bar give 100% efficient spraying action.

Littleford "Spray-Master" Bituminous Distributors are the most modern units on the market today. Made in either truck mounted or semi-trailer models. Sizes range from 800 to 4000 gallons.

"Spray-Master" Distributors are fast heating, safe, efficient, low-cost in operation. See your nearest Littleford Dealer or write.

LITTLEFORD BROS., INC., 485 EAST PEARL STREET, CINCINNATI 2, OHIO,

GLEDHILL

EARTH MOVERS

Will work with any wheel or small crawler type tractor capable of pulling 2 14" plows. Is front dump type scraper. Hydraulic control regulates depth of cut as well as dumping and spreading.
Comes in 1¼ and 2½ yd. sizes.

WEED SPRAYERS

This far-reaching yet low-pressure sprayer is just the ticket for roadside weed control. Field tested and found not only effective but most economical in operation. Two sizes —completely equipped with 50' hose attachment for hard-to-reach places.

Get complete information on the Gledhill line from our catalog — yours for the asking.

THE GLEDHILL ROAD MACHINERY CO.
GALION, OHIO

NOTHING ELSE LIKE AMAZING NEW

MEAD "MIGHTY MOUSE" BABY DOZER and TRACTOR

USEFUL FOR: Estate Owner, Landscaper, Municipalities, Street and Park Departments, Contractors, Project Engineers, Cemeteries, Sub-Dividers, Institutions.

Write for FREE Circular.

HIGH LIFT or LOW LIFT MODELS

Mead's MIGHTY MOUSE High Lift Tractor-Dozer pivots within its own length. Weighs only 1300 lbs. yet dozes and hydraulically lifts a 5 cubic foot capacity bucket up to 6 feet! Machine only 40½" wide, 95" long, 2 speeds forward and one reverse, 6 hp. engine. Front end attachments are bucket, dozer blade, mower or rotary broom; rear end pulls rotary tiller, cultivator, plow, scarifier etc.

It's a perfect answer to so many labor problems that we'd like to show you how it will do a dozen jobs wherever you have grading, excavating, back filling, towing, loading, snow plowing, brush removal, site clearing, road building and you think of the rest! Hydraulic lift, just like the big ones.

IT GRADES: Large tread area "geared to the ground," gives lots of traction for a heavy thrust. You can really push things around with "Mighty Mouse!"

IT CARRIES: Easily carries heavy loads, piles material high, climbs steep slopes.

IT DUMPS: Bucket trip lever at driver's left hand dumps load instantly, effortlessly, exactly where needed.

IT BACKFILLS: "Mighty Mouse" can soon pay its cost on this work alone, doing the work of many laborers and eliminating rental of heavy machines.

MEAD SPECIALTIES COMPANY, Dept. T-663, 4114 No. Knox Ave., Chicago 41, Illinois

more work if rollers and bearings are not too far gone.

As a rule, only one wagon drill is needed. It uses Timken steel and Timken standard rock bits, which have worked well in the two principal formations. The caliche is, of course, a soft formation, but the conglomerate resembles hard peanut brittle, with pieces of olivene, basalt, and other hard chunks embedded in the slick cementation. But the Timken bits have handled it well, lasting about 300 feet to a sharpening. The wagon drills average about 350 feet of hole a day. In neither formation do bits seems to have any tendency to stick, but sometimes after the caprock and caliche is penetrated, bits will drop out of sight in the soft sand below.

Ticklish Pioneering Job

Where the first long curve merges into a reverse curve, the highway intercepts a thin jutting outcrop from the high cliff, requiring a sliver cut with a slope 152 feet long. This cut was shallow only so far as yardage was concerned, but because it failed to reach underneath the surface sand sloughing into solid rock underneath, it, too, presented an interesting problem in pioneering.

After anxious hours, a Cat D8 and dozer worked its way around a dimple near the top of the cut, and began to work the material down. A few rock outcrops were removed, and the machine hit red sand. For 80 feet straight down it was touch and go, because the sand lacked stability to support the tractor up on the berm. Several times a track sagged over the side and hoisting winches had to be brought in to recover the rig. The machine removed 80 feet of the cut before there was room enough for two LeTourneau electric Tournapulls to come in and work.

In general, however, the softer grading will be routine, and even the truck-shovel haul should not be too difficult after the escarpment's back is broken and a haul ramp is established. Either a 54-B Bucyrus-Erie or a Northwest 80-D shovel will do the latter work. It is expected that the 2.9-mile section can be finished easily within a year of its October 20, 1952, starting date.

Personnel

Some of Isbell's key men are directing the field work on the site, including visits by Vice President W. J. Isbell himself. Arnold Blair is General Superintendent, assisted by J. H. Cox in charge of drilling and blasting, and by Jim Blair on grading equipment. J. E. Olson is the project timekeeper.

Nevada's engineering is under the general supervision of H. D. Mills, State Highway Engineer, with J. D. Meacham as Construction Engineer, Otis Wright as District Engineer at Las Vegas, and Vern Sharp as Resident Engineer.

Ultimately, to accommodate faster and more modern types of traffic, U. S. 91 will probably be realigned all along its 150-mile route from Las Vegas to St. George, Utah. Nevada has already made an excellent start toward such permanent alignment, completing various sections to a point about 60 miles east of Las Vegas. But all the rest of the way there is not likely to be a tougher piece of drilling and blasting than Isbell is doing to get the highway down off the top of Mormon Mesa into the Virgin River Valley.

Surveyors' Experiences

A collection of short articles on unusual surveying problems and their solution has been published by W. & L. E. Gurley, Station & Fulton Sts., Troy, N. Y. The Surveyor's Notebook—Series Two, relates actual field problems and their solutions.

Among the stories, which are all new, are experiences in surveying the Antarctic, methods for eliminating errors in precise alignment, and a discussion of how to cut down weather problems in the field.

Among the surveying tips are recommendations on the use of the gradienter; the method for using a level on a tractor for whipping mud flats; and a system of determining in the field, without calculation, whether or not a survey will close. Also described are ways to get more out of a compass, and new sources of income for the surveyor.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 311.

Need Holes in Concrete?

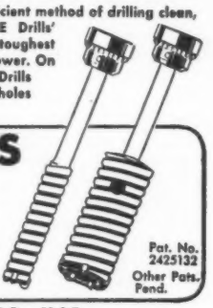
YOU GET MORE HOLES WITH TERMITE DRILLS!

Use the fastest, cheapest and most efficient method of drilling clean, accurate holes in masonry. TERMITE Drills' exclusive "WICTU" inserts penetrate toughest masonry at higher speeds with less power. On day-in and day-out drilling TERMITE Drills outlast other drills to give you more holes per dollar.

TERMITE DRILLS

- 41 diameter sizes from 3/16" to 5" (other sizes up to 8" on special order).
- Lengths up to 36".
- Exclusive worm design speeds drilling and reduces overheating of drill.
- Free Factory Resharpening.
- Use with standard electric drills or air motors.

Write for illustrated catalog and prices today.



Pat. No. 2425132 Other Pats. Pend.

Sold by leading Distributors in All Principal Cities

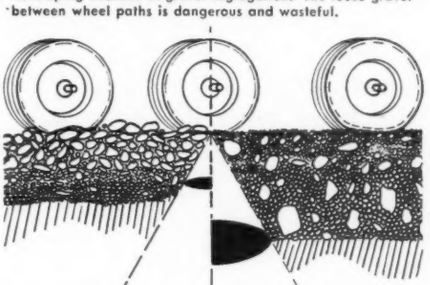
TERMITE DRILLS, INC.

87 NORTH LOTUS AVENUE, PASADENA 8, CALIFORNIA

STOP GRAVEL SEGREGATION!

only the SEAMAN provides the most efficiently mixed and blended base

A gravel road in which bumps, undulations and rippling are developing because of gravel segregation. The loose gravel between wheel paths is dangerous and wasteful.



In segregated gravel (left above) the fines have sifted leaving larger stones on top. This is an unstable condition with low load bearing value.

Stabilized gravel (above right) is firmly blended and knit throughout, has a high load bearing value and requires little maintenance. This result encourages traffic to use all of roadway instead of causing traffic compacted ruts or paths.

WHENEVER aggregates are transported or pushed, the larger stones remain in the top levels of a base. This segregation causes instability. No amount of compaction will correct it. It is the cause of many early base course failures regardless of the binder used.

The SEAMAN in its mixing action *blends* the coarse material with the fines so that all sizes are found in uniform proportions throughout the base. Voids are properly filled with fines to support the larger material.

And because a large volume of materials in process are constantly carried forward in the mixing chamber of the SEAMAN, irregularities in the size of aggregates are blended to uniform gradation.

The correct placement of materials is the basic principle of SEAMAN-mixing. So no matter what binder you use, you'll stop segregation, build a stronger, more weather-resistant, low-maintenance pavement at far less cost—with a SEAMAN!

FREE BOOK—The Seaman Self-Propelled Pulvi-Mixer and the SEAMAN Self-Propelled TRAV-L-PLANT are fully described in this new 12-page Bulletin. Also shown are many job scenes together with operational suggestions. Ask for Bulletin TPS. *Send a postcard today.*

The Seaman Self-Propelled Pulvi-Mixer, 7 foot mixing width. Gasoline or diesel powered. This unit will mix and finish one mile of 3 inch oil mix at a cost of less than approximately $50.00.

SEAMAN MOTORS Inc.

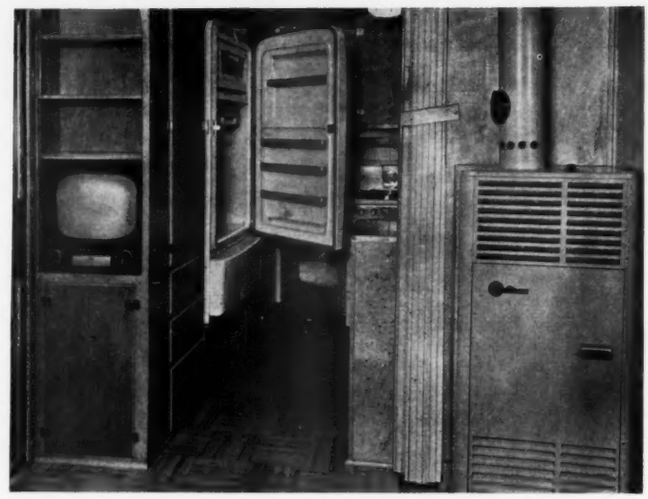
282 N. 25th St.
MILWAUKEE 3, WIS.

Trailer Facilities For Living on Site

Trailer homes in a variety of sizes and accommodations are offered by the Pontiac Coach Co., Drayton Plains, Mich. The trailers are furnished and come in a number of floor plans to provide a choice in living arrangements.

A typical living room has a Simmons sofa that opens into a bed, a Duncan Phyfe drop-leaf dining-room table, occasional chair, and two lighting and traverse draw drapes. There are large full-length mirrors. The air heater is thermostatically controlled, and the circulating system may be used independently in the summer.

Finishing touch for modern living is a built-in television cabinet that fits a 17-inch set. Interiors are finished in natural birch plywood and floors are of Armstrong inlaid linoleum. Ceilings in most models are 7 feet high.



Interior of the Pontiac trailer shows three of the comforts of home—an air heater, a 9-cubic-foot refrigerator, and a television cabinet.

Kitchens have a 2-compartment ledge-type sink and a Sunray apartment-type 4-burner oven range. A 9-cubic-foot Westinghouse refrigerator with a 67-pound freezer compartment, and an automatic electric hot-water heater are other basic equipment. Most models have a glass-front china cupboard.

Porcelain bathtub, shower, and flush toilet make a complete bathroom. A typical bedroom has a full-size Simmons bed, a dressing-table vanity, drawers, and wardrobes.

For further information write to the company or use the Request Card at page 18. Circle No. 327.

Use of Local Material For Stabilized Pavement

A new booklet that tells how to use local materials for stabilized heavy-traffic pavement is offered by Seaman Motors Inc., 305 N. 25th St., Milwaukee 3, Wis. The basic process described uses the company's Pulvi-Mixer prominently.

The booklet divides the paving procedure into its fundamental parts and covers subgrade, subbase, base, and wearing surface with special sections for each.

Among objectives of the booklet, according to the manufacturer, is to make possible the expanded use of local and of substandard paving materials to cut transportation costs. The method is also intended to provide a pavement that may be constructed with low-cost equipment and with a minimum of skilled operators.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 300.

Ryan Elected President, Deike Is Board Chairman

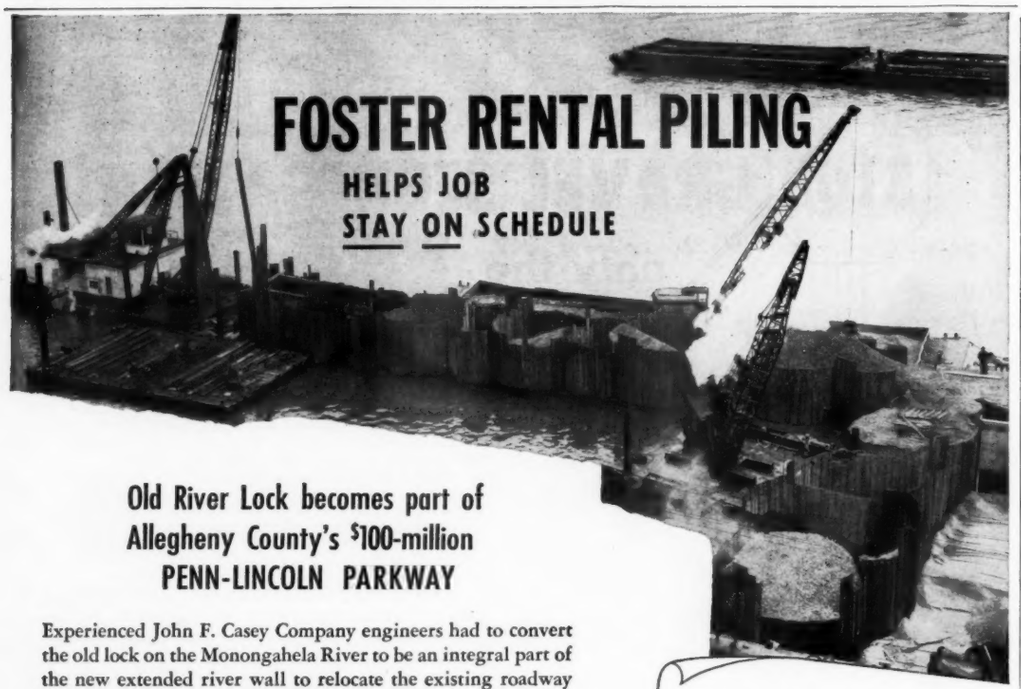
J. T. Ryan, Jr., has been elected President of Mine Safety Appliances Co., Pittsburgh, Pa., succeeding George H. Deike, Sr., President of the company for 39 years, who was named Chairman of the Board.

Mr. Ryan is President of Callery Chemical Co., a subsidiary of Mine Safety Appliance Co., engaged in research and production of highly specialized chemical substances. He is also a director of MSA subsidiaries in Canada, Scotland and South Africa.

Mr. Deike is President and Director of Carbon Monoxide Eliminator Corp. and Catalyst Research Corp., as well as President of Pennsylvania Research Corp., and Director of Follansbee Steel Corp.

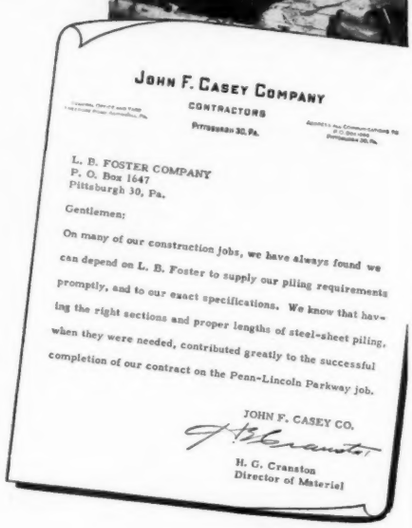
Mine Safety Appliance Co. manufactures safety equipment for virtually every industry, and for the use of the armed forces and private citizens.

"Got any suggestions?"



Old River Lock becomes part of Allegheny County's $100-million PENN-LINCOLN PARKWAY

Experienced John F. Casey Company engineers had to convert the old lock on the Monongahela River to be an integral part of the new extended river wall to relocate the existing roadway and accommodate the new Penn-Lincoln Parkway. Casey engineers drove cellular cofferdams averaging 23'9" in diameter to keep water seepage to the minimum on this tremendous engineering project. Their careful planning insured an efficient, uninterrupted work schedule in constructing the river wall, and an important part of the schedule depended on Rental steel-sheet Piling from Foster. Foster delivered ahead of schedule, in the exact sections (MP-112) and in the specified lengths.



JOHN F. CASEY COMPANY
CONTRACTORS

L. B. FOSTER COMPANY
P. O. Box 1647
Pittsburgh 30, Pa.

Gentlemen:

On many of our construction jobs, we have always found we can depend on L. B. Foster to supply our piling requirements promptly, and to our exact specifications. We know that having the right sections and proper lengths of steel-sheet piling, when they were needed, contributed greatly to the successful completion of our contract on the Penn-Lincoln Parkway job.

JOHN F. CASEY CO.
H. G. Cranston
Director of Material

On your next Piling job, call Foster for the exact sections, in the exact lengths . . . on the job when you need it, and at Foster's standard low rental rates that allow considerable saving.

NEW PILING CATALOG
Just Released!
Describes steel-sheet Piling Sections and construction data. Ask your nearest Foster office for Catalog CE-6.

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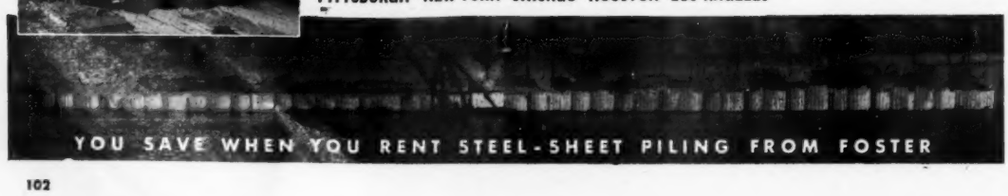
Call on Foster for All Your Needs—
RAILS · SWITCH MATERIAL
TRACK ACCESSORIES, TOOLS
PIPE AND FABRICATION
WIRE ROPE AND SLINGS



Rig Pads Pipeline

A new 275-hp Euclid scraper is being used by Anderson Bros. Corp., Houston, Texas, for padding 150 miles of 24-inch pipe which the contractor is laying in rocky country between Menard and Cedar Valley, Texas, for the Rancho Pipeline Co.

The rig—selected because its independently actuated hydraulic ejector enables it to feed a closely controlled flow of material to the screw—has made it possible to cover more footage per day with 15 men and one truck, where formerly a padding crew of 35 men with 7 dump trucks were employed.

The feed screw of the unit is chain-driven from a gasoline-powered engine mounted above it to the top of the scraper bowl. The scraper is top-loaded with a front-end loader.

This "Euc" has a power-driven screw which feeds material out of a side chute. Anderson Bros. Corp., Houston, Texas, used it for padding pipe laid in rocky country.

Road-Surfacing Bond

A new black liquid bonding agent for repairing, resurfacing, and patching old roads, new driveways, parking areas, and loading docks is introduced by the Dasco Chemical Corp., 1602 Thames St., Baltimore 31, Md. Das-Top is mixed with crushed stone about ½ inch in size and smaller. A coating of the mixture is then applied to any concrete or asphalt surface in a layer from ½ to 2½ inches thick. Larger stones are recommended for filling deep ruts or holes. These should be topped with a ½-inch thick layer of mixture.

The liquid bonding agent mixes either by turning with a shovel or in a small tumble-type concrete mixer. Used in a proportion of one gallon to 300 pounds of stone, the gallon is said to cover a surface of approximately 25 square feet.

After the installation has been completed, a sprinkling of sand or stone dust will speed hardening to a plastic top surface that is water and frost-repellent.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 203.

Line of Concrete Vibrators

A booklet on gas, electric, and pneumatic-powered concrete vibrators is available from the Mall Tool Co., 7740 S. Chicago Ave., Chicago 19, Ill. Among the gas-engine vibrators are 2 and 5-hp units on round base mountings and a 5-hp unit with wheelbarrow mounting. One-man vibrators offered are rated at 1, 2, and 3 hp.

The booklet also shows a tuck pointer's saw for routing old mortar, concrete rubbing machines, a ¾ hp electric concrete surfacer, and a line of sump pumps.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 194.

Dravo Elections Held

John K. Beidler, General Manager of the Machinery Division, and Louis P. Struble, Jr., General Manager of the Keystone Division, were elected Vice Presidents of Dravo Corp., contractors and engineers, Neville Island, Pittsburgh 25, Pa.

Clifford A. Hill, formerly Controller, was elected Treasurer.

Loader Attachments

Attachments available for the Athey Model 5 force-feed loader, a conveyor-type windrow loader, are shown in a booklet from the Athey Products Corp., Dept. C&E-4, 5631 W. 65th St., Chicago 38, Ill.

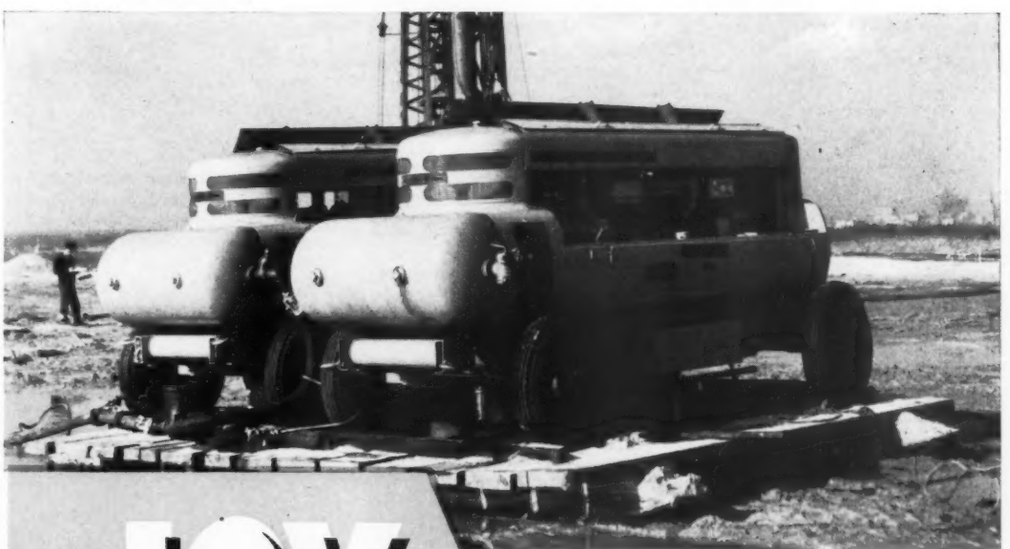
The attachments include an auger-feeder front end for stockpile loading, a cab for year-round work, a side discharge conveyor for faster loading of trucks, three rear axle arrangements to meet any type power or flotation requirements, a cleated belt for loading snow, and 3-foot conveyor extensions for over-cab loading.

The loader has hydraulic controls, a Ford 100-hp engine, and direct mechanical drive.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 310.

Here's the BIGGEST Portable!

Gives you 5% MORE AIR THAN ANY OTHER ON THE MARKET



JOY "630"

The Joy "630" is a *big* portable—output is 630 CFM—but it's designed for real portability. Light in weight, compact and rugged, the "630" is actually smaller than many other units of less capacity.

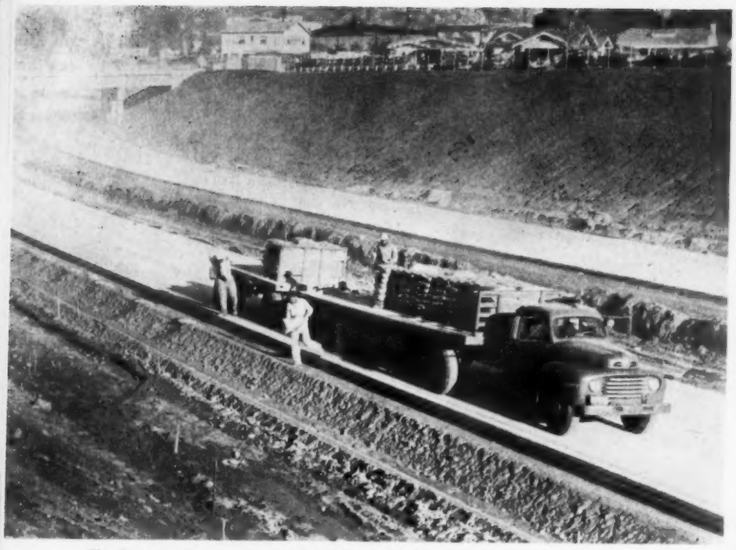
The Joy "630" is a completely self-contained compressed-air plant. Electric starter, full force-feed lubrication, "Cascade" oil cooling, two-stage compression, and many other advanced engineering developments enable it to out-produce all others. You'll find the Joy "630" a bear for work—it will operate *two* 4" wagon drills—and you'll find it able to cope with your heaviest air requirements. ● Write for Bulletin GG-1P. ***Joy Manufacturing Company, Oliver Bldg., Pittsburgh 22, Pa.*** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

W&D C4633

Consult a Joy Engineer

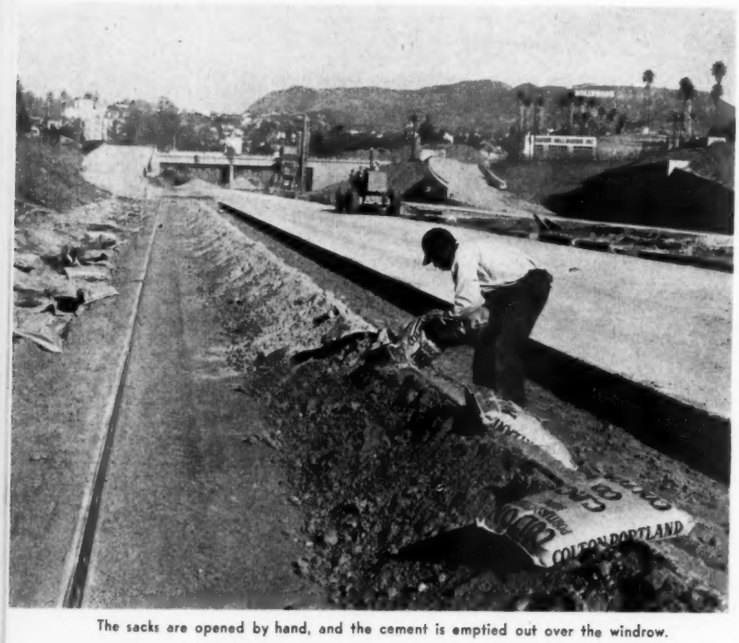
JOY

CONSTRUCTION EQUIPMENT MANUFACTURERS FOR OVER HALF A CENTURY



The first step in cement treatment of the subbase is the distribution of the sacks of cement. They are placed 6½ feet apart on the material that has been windrowed from the 4-inch base course.

Compaction is started with a Huber tandem roller ballasted to 14 tons.



The sacks are opened by hand, and the cement is emptied out over the windrow.

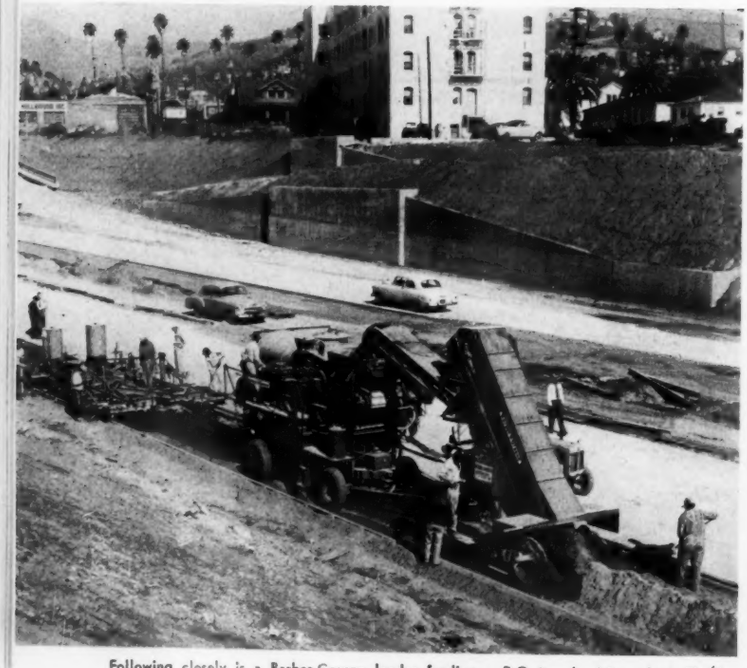
Concrete Pavement on

Cement-Stabilized Base

By RAY DAY

• BETWEEN Western Avenue and Hollywood Boulevard in Los Angeles, one of the most important sections of pavement on Hollywood Freeway is now being laid. When Webb & White of Los Angeles finish the $1,500,000 contract for 3,700 feet of the multi-lane divided freeway, only two more short sections will remain to hook the downtown and Cahuenga Pass sections of the expressway together. Then the California Department of Public Works can breathe more easily for a time, because one of the most important components of the Los Angeles expressway system can begin to function as planned.

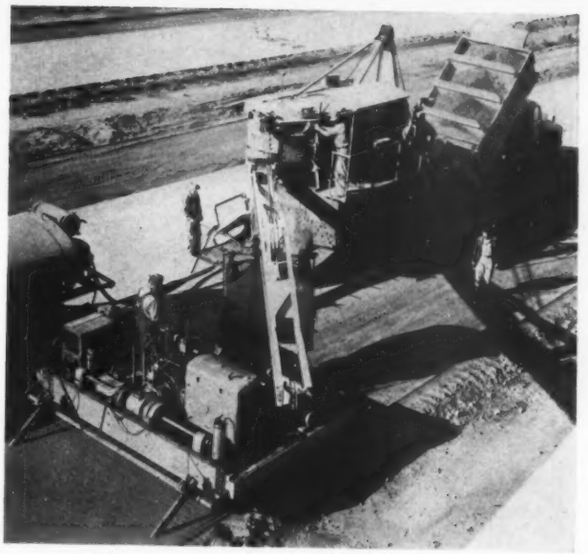
Webb & White's job is entirely in a depressed section, with numerous bridges throughout the job to carry crossover traffic from Los Angeles



Following closely is a Barber-Greene loader feeding a B-G travel mixing plant. The base material, mixed with cement and water, is leveled off with a trail drag.

A Caterpillar No. 12 motor-grader next shapes the treated base to exact grade. A Buffalo-Springfield roller, equipped with rubber tires, contributes the final compaction.

A MultiFoote 34-E Duomix paver deposits concrete in front of a Jaeger concrete spreader, followed by a Jaeger-Lakewood finisher.



Ford trucks deliver four batches each of dry concrete to MultiFoote paver.

and Hollywood streets. The job includes major grading, installation of base material, cement treatment of the upper 4 inches of base, installation of the 8-inch x 12-foot concrete traffic lanes, construction of curb and gutter and asphaltic concrete ramps, erosion control, and cleanup work on the dividing median.

Standard Design With Refinements

Generally speaking, the design of this section of freeway follows standard practice of the California Department of Public Works, but there are certain refinements such as the control of contraction cracking with special skewed weakened-plane joints installed by sawing. There is also considerable curb and gutter work, along with asphalt-concrete paving, in connection with access and outbound ramps and bus-loading areas.

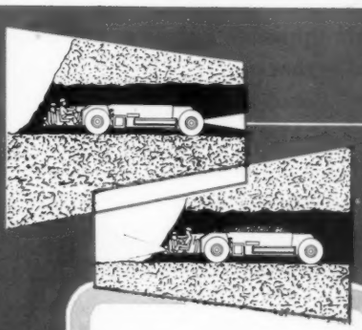
On the 3,700-foot job, 3,050 feet calls for four standard 12-foot portland-cement concrete lanes 8 inches thick, placed on each side of a dividing median. The remaining portion of the contract—nearer the Hollywood end—calls for three 12-foot lanes on each side of the median strip. Underneath these paving strips is 16 inches of select granular base, the upper 4 inches of which is treated with 2¾ per cent by weight of portland cement. The earth subgrade beneath this base calls for 90 per cent compaction. However, 99 per cent was usually obtained. Base and subgrade specifications beneath the seven 6-inch asphaltic-concrete paved on-off ramps are similar to those which govern the main paving.

The freeway is designed for an average daily traffic count of 120,000 vehicles, but the completed sections have pulled so much traffic that the facility is already operating at capacity. It is next to impossible to make origin-and-destination surveys on such a highway, so California's engineers are hoping that the traffic count will not increase appreciably in the next few years. Because of costs to date, further expansion might present a problem just now.

Pavement cracking caused by surface contraction will be controlled by sawing a ¼ x 2-inch groove through the pavement surface every 15 feet. These cracks are skewed

(Continued on next page)

DART DOES IT AGAIN!



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UNDERGROUND

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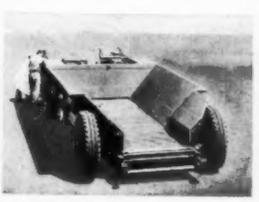
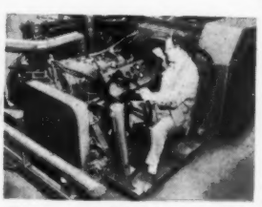


Hydraulic power enables conveyor discharge feed from 0 to 60 feet per minute.



The operator's "office" puts all instruments and controls in easy reach. Excellent vision driving in either direction.

POWERED BY 275 H.P. Diesel engine with torque converter and fully reversible transmission. Perhaps the largest H.P. rating to be used on an underground truck. Design is adaptable for conversion to electric power.

FULLY REVERSING, large Hydraulic Motor operates apron conveyor. Breakage and maintenance are reduced to a minimum.

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THE UNUSUAL ENGINEERING and design in the new DART UNDERGROUND is indicative of DART'S constant aim . . . to carry more, faster and with greater efficiency.

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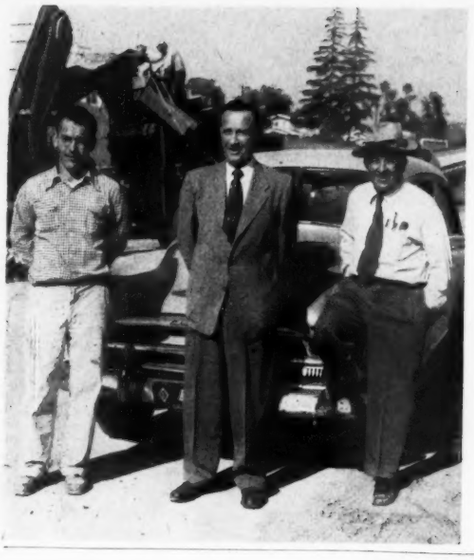

Superintendent Ray Mason; Contractor Spencer Webb; and Resident Engineer Ray A. Collins.

An International TD-9 with Hough front-end shovel loading excess dirt into a dump truck.

Some new thinking on DENSITY in ASPHALT ROAD CONSTRUCTION

IN VIEW of the fact that density under a screed or tamper varies with the thickness of material above the high or low spots in the subgrade, and in the presence of large stones in the mix, any approach to securing absolute uniformity in the thickness of a road from subgrade to surface would be an approach to uniformity in density. Obviously uniform thickness is the result of accuracy in grading and accuracy in spreading.

Here, for the first time, is a real approach to the ideal conditions required for absolutely uniform density and uniform thickness with a truly level course the full width and length of any road, from subgrade to surface.

The Adnun with the Fluid Level is not just a Black Top Paver! Not just a Material Spreader! With the Fluid Level the Adnun is a complete Road Builder! The Fluid Level makes it possible to begin with your properly graded subgrade and lay the base course of any material to an absolute plane the full width and length of the road. Successive courses of asphalt will be equally uniform. With uniformity of thickness in each successive course from subgrade to surface you have an approach to uniformity in density never before possible.

The Fluid Level takes out the dips that won't show under a straight edge. It brings long wheelbase results to an already compact, easily portable unit. It makes possible greater surface smoothness that results in better drainage and reduced breakdown. The possibility of holding error to within one or two per cent, means less waste of material and cuts costs to the taxpayer and the loss for the contractor. Investigate this method of building roads. It brings you a long sought answer to better built, lower cost roads that will go far toward meeting today's traffic problems.

Ask for the booklet, "Put A Level On Your Roads", for more details.

This little booklet entitled, "Put A Level On Your Roads", tells you all about the Fluid Level. If you haven't seen it, send for it.

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Concrete Pavement on Cement-Stabilized Base

(Continued from preceding page)

2½ feet in each 12-foot slab, in order to make single-wheel instead of dual-wheel load transfers. There are no expansion joints in the pavement.

The various lanes are tied together by a ⅓-thickness construction key and by ⅝ x 15-inch tie bolts at 30-inch centers. These bars consist of two halves, joined together by a center nut. The second half of a tie bar is placed after the adjoining lane is formed, the base stabilized, and it is all ready for paving.

Mucky Excavation

In some respects the grading portion of this section was unusual, because the upper part of the excavation prism was an unusually soggy adobe soil. Still remembered in the area is the all-night clacking of dipper flaps as power shovels tried to disgorge the sticky stuff into waiting dump trucks. At first, a pair of Northwest Model 6 shovels were tried, but the muck was too wet for efficient shovel work. Dragline booms were then brought in for the machines, and better loading was done.

Hauling units consisted of a fleet of 20 company-owned Ford F-8 batch trucks, along with a 20-unit fleet of dump trucks owned by Camillo Bros. of Los Angeles. By using the completed freeway into Los Angeles, these dump trucks were able to make a long 8-mile haul to the Bishop's Road disposal area with a maximum of only four traffic lights.

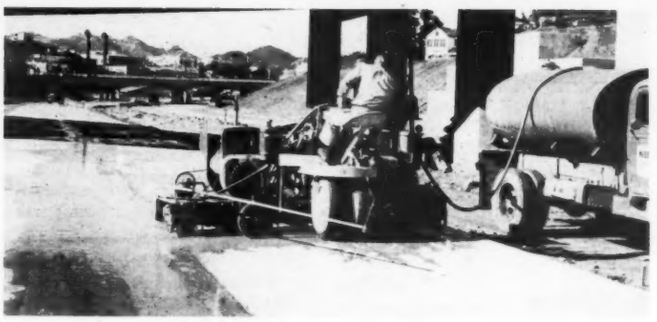
An International TD-9 tractor with a Hough front-end loader was also used to excellent advantage in grading. In some cases it actually loaded trucks from the primary excavation prism, turning out as high as 158 ten-yard loads in an 8-hour shift. It worked behind the draglines making rough grade, loaded many yards of excess or irregular material, and often worked with the base-course gang later on to distribute that material. The machine was equipped with street plates instead of track grousers so it could move quickly from one place to another.

Rapid Base Treatment Made

One of the most interesting technical parts of the project was the installation and treatment of the special granular base course. This operation was organized so tightly that a 3,700-foot lane 12 feet wide could be processed in only 3½ hours, so far as its cement treatment was concerned.

The 16-inch granular base material came from a deposit known as the Hollingsworth Pit near Forest Lawn Cemetery in Glendale, and consisted of a fine sandy gravel. Webb & White's fleet of Ford F-8's trucked the material in, and dumped it volumetrically to give a 4-inch compacted thickness for four similar lifts. When the trucks dumped the material, it was blended by blademixing with a No. 12 Caterpillar motor grader. Water was also added to bring its content near optimum. When a good blend of particles and moisture had been developed, the base material was spread by the blade and compacted by 12-ton 3-wheel Huber rollers. The material compacted readily to about 130 pounds per cubic foot, dry weight, and developed high bearing value.

Finish grade behind the last lift was cut very carefully by a No. 12 motor grader, so that exactly the right amount of material would be in place. When the Blaw-Knox steel forms were brought in, survey grade and line stakes were established every 50 feet to control line and elevation of the steel headers to fine tolerance. Each of these precautions, it was believed, added workmanship to the job and made concrete yields in the pavement slabs much more uniform.



Contraction joints are cut with a Lewis saw.

When the 3,700-foot header line was set for a lane, the next step was a grade-sizing by the No. 12 Caterpillar motor grader. This step consisted of blading the top of the base material to an absolutely true section, 0.02 foot low from theoretical grade to insure full thickness of concrete pavement later on. Special equipment was used to make this cut.

The special rig was shop-built by the contractor's mechanical force, and consisted of a pair of 12-inch extensions mounted on each end of the 12-foot motor grader blade. The extensions were bolted to the moldboard, mounted on rubber-wheeled dollies, and carried screw-type adjustments which could be adjusted to set the blade at any desired depth. One pass by this rig and the grade was absolutely true.

Dropping the dolly-mounted extensions, the motor grader next ripped up the upper 4 inches of the finished base with its scarifier teeth, and windrowed the material in the center of the lane between the forms. This operation took but little time, and was usually done throughout the length of one of the lanes.

According to Resident Engineer Ray Collins, the application of portland cement by metering into a windrow has never worked out as accurately for him as spreading it in sacks. On this job every 6½ feet called for a sack of portland cement, so the spacing was accurately marked out on the completed slab with the aid of a 6½-foot stick. Workmen then moved along with a truckload of sacked cement, and placed a sack opposite each of the marks on top of the windrow. This method also had another advantage, especially during California's wet winter season. In case of rain, cement treatment could be chopped off

(Continued on next page)

Photo—Courtesy Macadam Pavements, Inc., Columbus, O.

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Specifications on this paver call for handling an 11″ depth but contractor got very satisfactory results putting down 14″ of loose stone in 12½′ widths—better than 150 tons per hour. By getting along *without forms* further savings were made.

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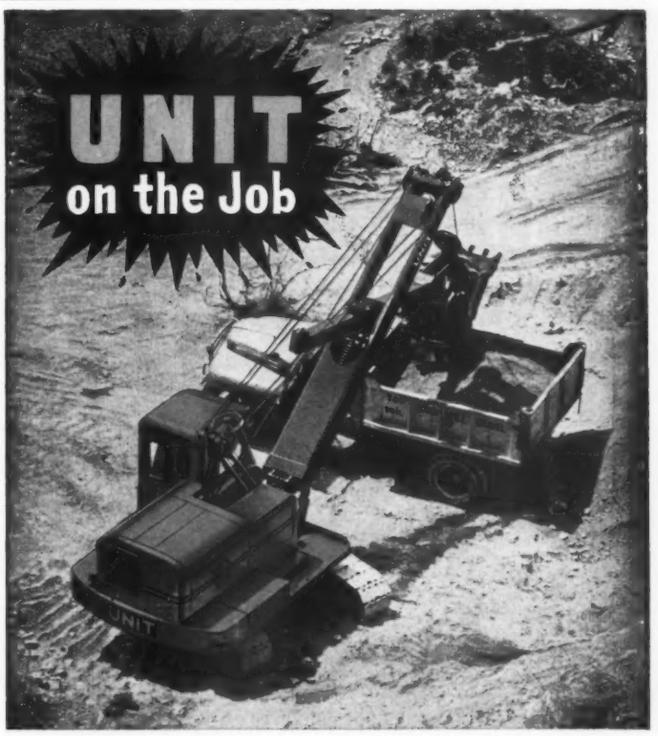

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All Models Convertible to ALL Attachments!

Concrete Pavement on Cement Stabilized Base

(Continued from preceding page)

at any point and the unopened sacks picked up. During periods when rain was predicted, crews were especially careful in this regard. The 6½-foot spacing insured delivery of 2¾ per cent of cement by weight in the windrow—or enough to prevent subgrade pumping and build up about 400 to 700 pounds of compressive strength in the treated base.

The windrow mixing was done in a manner which is somewhat of a departure from California standard practice. A Barber-Greene auger-feed, bucket-type loader was hooked in tandem to a Barber-Greene traveling pugmill to pick up the entire windrow and mix it thoroughly with the required amount of moisture. The method had two advantages. If any oversize particles were present in the base course material to endanger compaction — they bridge over, with uncompacted pockets adjacent — the screw auger feeding the loader kicked them out where they could be removed and rejected. A second important feature was the fact that the full 30 feet of the grade underneath the rig was visible at all times, so there was no doubt that all the windrow was being picked up.

Approximately 11 per cent moisture was added during the mix by towing a 4,000-gallon tank trailer alongside the mixing plant. The outfit moved along at a speed of 18 fpm, doing an excellent job of mixing. The same Barber-Greene pugmill, with modifications, will be elevated on jacks later in the job and used to mix the 6-inch cement-treated base for the 4-inch ac ramp surfacing.

Directly behind the mixing plant on a cable tow was a leveling drag. It was shop-built from an old Johnson longitudinal concrete-finishing frame. It had V-shaped blades to drag the mixed material flat, and a pilot knockdown blade sufficiently adjustable to move material uphill on superelevated curves. Only one man was needed to work along with this drag, filling in occasional low spots which it had left.

Directly behind the drag worked a 12-ton Huber tandem roller, ballasted with water to weigh 15 tons. It rolled the treated material repeatedly until compaction had obviously been developed. The Caterpillar No. 12 blade then moved in, with its dolly-mounted blade extensions in place, and made a pass to again shape the grade to its true height.

A self-propelled Buffalo roller, equipped with rubber tires instead of steel drums, then worked with the motor grader until the top of the material was compacted and true. The final step was an application of 0.1 gallon of 60-70 asphalt emulsion to act as a seal and cure for the cement-treated base. The lane was then ready for concrete pavement.

Paving: 100 Cubic Yards Per Hour

The placement of portland-cement concrete paving was usually on a 3,700-foot lane basis, with the crew continually trying to complete one of the lanes in a single shift in spite of numerous bridges under which they had to pass. Surprisingly enough, they often came very close, because the paving output was geared to a production of about 100 cubic yards an hour.

The 1½-cubic-yard concrete batches contained 1,440 pounds (22 per cent) of 2½-inch-minus rock; 620 pounds (12 per cent) of 1½-inch-minus rock; 1,140 pounds (28 per cent) of ¾-inch-minus rock aggregate; 1,960 pounds (38 per cent) of sand; and 705 pounds of cement. The water content was designed on the basis of 50 pounds per sack, giving a workable placing slump around 2¼ inches and a 28-day flexural strength of 600 pounds.

Webb & White used a fleet of only four Ford F-6 batch trucks to keep the Multifoote 34-E Duomix paver supplied with dry batches. Each truck hauled four batches per trip, and the job was arranged so that a loaded truck stood in front of the paver skip at all times. Mixing water, hauled from city mains, was delivered to the paving site by a 2,500-gallon International truck-mounted tank, which transferred the water to the 4,000-gallon tank trailer towed along beside the paver. A permanently mounted transfer pipe with flexible hose connections on the truck and a Wisconsin driven pump completed the transfer.

The paver was mounted on smooth street-plate crawlers, so that no special precautions had to be taken to

LEADING CONTRACTORS USE McCarthy Drills

PUBLIC UTILITY AUGER DRILL

Bores holes from 4½" to 24" in diameter under sidewalks, roads, building foundations, railroad tracks, landscaped grounds, etc. Fithian Contracting Co., Youngstown, O., using McCarthy Public Utility Auger Drills, completes pipe line jobs, formerly taking weeks, in a few days.

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Will bore 6" and 8" diameter holes 120 feet horizontally at rate of six feet per minute maximum. Four individual, self-locking jacks maintain correct drilling level. In one day a New Castle, Pa., operator bored holes of various depths totaling 840 ft. through shale and sandstone, using this McCarthy Auger Drill.

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VERTICAL AUGER DRILL

Operating men who have made actual on-the-job tests find the McCarthy Vertical Auger Drill a standout for mobility, stamina, ruggedness and versatility. On a 2-million dollar, 5-mile stretch of superhighway between Hubbard, Ohio, and Sharon, Pa., The Apex Powder Co., Canton, Ohio, cut blasting costs approximately 20% as compared to air, well or churn drilling. Cutting through two large areas of concentrated rock, 150 holes 15 feet deep were bored for each blasting pattern. 3,000 cubic yards of sand rock were moved at each blast. Due to the ruggedness and mobility of McCarthy Drills, there was no time lost. For further information, write Salem Tool Co. and our distributor will contact you.

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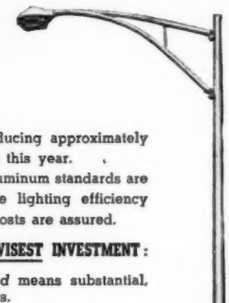

Special 28' tapered All-Aluminum standard with 8' overhead lighting upsweep arm on Lakeshore Drive, made to Chicago Park District specifications.

(Photo courtesy Chicago Park District)

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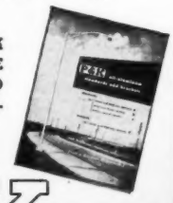
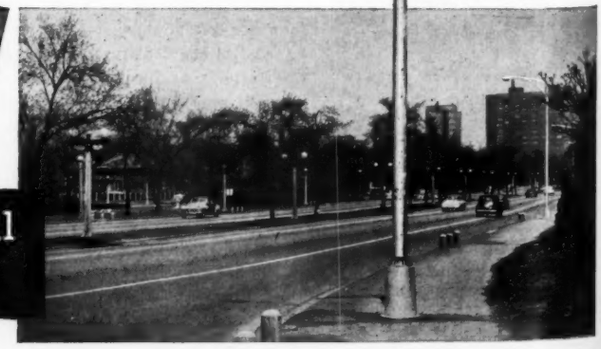




Pfaff & Kendall

84 Foundry Street
Newark 5, New Jersey

prevent damage as it moved along on previously placed slabs. Batches from the machine were dropped on the grade close to the center point, just ahead of the spreader screw on a Jaeger concrete spreading machine. Two Viber internal-type electric vibrators mounted on the frame behind the spreader consolidated the fresh concrete thoroughly at the form lines. These vibrators were placed just in the clear of the tie bolts on the previously poured lane, and about the same distance from the form line on the opposite side of the lane.

Following the Jaeger spreader was a Jaeger Lakewood concrete finisher, equipped with a center tamping bar and two screeds. It placed the initial mechanical finish on the concrete surface, and stayed up closely behind the spreader. Final mechanical finish was put on by a Johnson longitudinal float finisher, which moved along well behind the other machines. Cool, shaded areas underneath the many bridges crossing over the project created a somewhat exceptional finishing condition for this machine, and it was usually necessary for the operator to skip these places to put the finish on sunny areas first, and then return sometimes hours later to catch the slower-hardening areas under the bridges.

The final finish on each lane consisted of a burlap drag, which roughened the concrete surface longitudinally just enough to build up excellent traction.

Pavement Joints Sawed

Within 24 hours from the time the concrete was first placed, mechanical sawing of the contraction joints began. A rather extensive study has been made from a practical angle by Resident Engineer Ray A. Collins and General Superintendent Ray Mason, and several things have been learned.

Webb & White is subcontracting this part of the work to Hurst Lewis, who is using an 8-blade self-propelled Concut saw. The machine is sufficiently well powered to cut a ¼-inch groove 2 inches deep at the rate of 6 fpm, because the various blades have 7 carats of commercial diamonds and will handle 1000 feet of cutting before they dull appreciably. But 6 fpm in one of the concrete lanes only a day old is usually too fast, according to Collins. By reducing the sawing speed to 1½ fpm, the tendency for the blades to throw aggregate spalls out of the green concrete has been eliminated entirely. Even at that reduced speed, the machine will saw one of the 12-foot joints in 2½ minutes. It takes 45 seconds to move down to the next.

As a general rule, the joint cutting starts on 60-foot centers, with the machine then moving back to catch up the spaces between. Collins and Mason have learned the importance of making visual inspections of previous lanes to see which joints are beginning to crack through the remainder of the slab. When such joints are found, they are identified with a spot of paint, and those joints have the highest sawing priority when the adjacent lane is placed. Unless the saw makes its cut as soon as possible in a place like this, there is danger of an uncontrolled crack developing as an extension of the opening in the earlier slab.

The first 3,700-foot lane produced only four uncontrolled cracks, but the finer points of sawing had been mastered so well on that lane and applied to succeeding pours that no uncontrolled cracks whatever have developed on succeeding lanes.

Batch Plant Setup on Site

An efficient method of batching concrete was designed by setting up a small automatic Noble batch plant in a cleared area near the west end of the project within the right-of-way. A materials contract was then arranged with Consolidated Rock Products Co., a commercial concrete outfit which specializes in such work over all of southern California. The company hauled sand and aggregates from San Fernando Valley and San Gabriel River deposits, where they were blended to make a durable, consistent mix.

The batch plant was set up near a bridge at Hollywood Boulevard in such a way that inbound trucks with aggregates and sand could come in on the inbound ramp, while empty trucks on the way back could leave for the pit sites by way of the exit ramps. The fleet of Ford F-8 batch trucks, each of which hauled four 1½-yard batches per trip, used previously placed lanes to reach the paver in all but the first-lane placement.

Completion of the Webb & White job leaves only one further section to be constructed from Hollywood Boulevard to Cahuenga Pass, and this section is now under construction by two contractors.

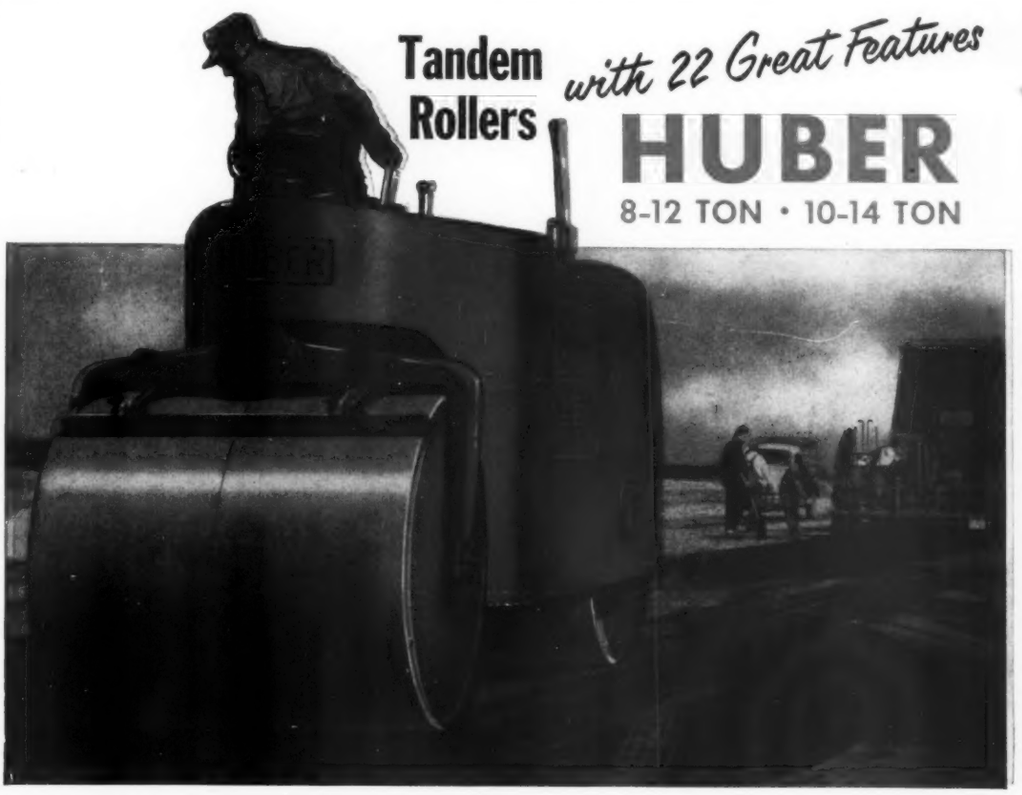
Personnel

On-the-job supervising officials included General Superintendent Ray Mason for Webb & White, and Resident Engineer Ray A. Collins for the California Department of Public Works. By giving every phase of the job their close personal attention, Collins and Mason were instrumental in the development of one of the happiest, most efficient paving crews yet seen on Hollywood Freeway.

California Department of Public Works operations generally are under the supervision of George T. McCoy, State Highway Engineer. Don G. Evans is Construction Engineer, and P. O. Harding is Assistant State Highway Engineer in charge of highway work in the Los Angeles Metropolitan Area.

Walsh Is Chief Engineer

Raymond L. Walsh has been promoted from Assistant Chief Engineer to Chief Engineer of Universal Atlas Cement Co., New York, N. Y.

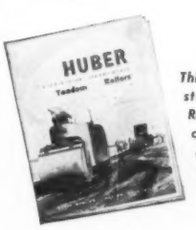


Here's a new HUBER Tandem Roller that offers new standards of performance in terms of speed, dependability, smooth operation and long life.

Make up a check list of every feature you'd like to see in a tandem roller—and see for yourself how HUBER has anticipated your needs. More than a score of major and minor refinements are incorporated in its design and construction.

Such features as permanent bearing alignment in the kingpin and swivel pin assemblies, the wrap-around frame that gives you a new concept of rigidity, and HUBER's perfected version of fluid coupling are among the improvements that will catch your interest.

The best way to get the whole story is to see one of the new HUBER tandems in action. Second best is to write for a copy of the new HUBER TANDEM ROLLER BULLETIN, No. T-152. Send for your copy today, or see your nearest HUBER Distributor.

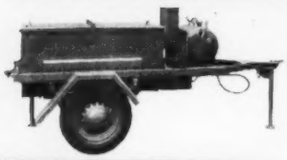


This 16-page bulletin, T-152, tells the story of the new HUBER Tandem Rollers in pictures and descriptive copy. Ask for your copy—address requests to Huber Manufacturing Co., Marion, Ohio.

HUBER MANUFACTURING CO. • Marion, Ohio, U. S. A.
Manufacturers of Huber Maintainers, Graders and Complete Line of Rollers

HUBER

for Hard Use and High Speed Trailing



"SPEED-MASTER" KETTLE

Saves up to 50% in fuel and time in melting asphalt, tar, pitch, bituminous compounds. The only kettle with flat surfaced heating tubes that provide greater heating surface. Heats and melts as much as 2 ordinary kettles. Has "Flash-Proof" Flues. Trailer models up to 230 gal. size. Can be furnished to burn kerosene or L.P. gas, and with hand or power spray attachment and barrel hoist.

BOTTOM-FIRED KETTLE

Or, if you prefer, here's the old reliable Hauck kettle with improved kerosene torch burner mounted outside the kettle. Sizes to 165 gal., on tires or steel wheels.

OTHER HAUCK HEATING FAVORITES

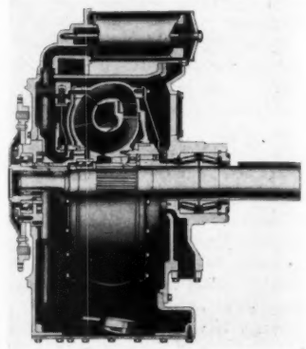
HAUCK MANUFACTURING CO. 116-126 Tenth Street, Brooklyn 15, N. Y.

New Industrial Drives Have Construction Uses

Five new industrial drives suitable for construction machinery are announced by the Twin Disc Clutch Co., Racine, Wis. The new drives include a 2-stage hydraulic torque converter, an air-actuated clutch, a disconnecting hydraulic power take-off, a 2-speed transmission for use behind torque converters, and an oil-actuated multiple-plate clutch.

The torque converter develops up to 4:1 torque multiplication at stall, and provides progressively increasing engine speed during acceleration and uniform pull-down under load. Principal feature of the converter is its free-wheel reaction or stator blades, which completely unload the engine at high-speed, no-load conditions.

The basic 2-stage converter unit is the Model S, which offers a standard spider drive input, and has a built-in converter charging pump around the input shaft adjacent to the drive spider. Inlet and outlet connections are provided for piping the converter fluid to and from a cooler. The cooler can be either an oil-to-water heat exchanger or an oil-to-air radiator.



The Twin Disc 2-stage hydraulic torque converter Model SD.

A disconnecting-type model, the SD, has dump valves on the rotating turbine wheel to permit release of the oil from within the converter circuit, and a 2-position control valve on top of the stationary converter-housing for actuation of the dump valves.

This model is compact in size; its over-all length is said to be considerably less than a converter equipped with a conventional friction clutch between converter and engine.

More details can be had by writing to the manufacturer or by using the Request Card at page 18. Circle No. 304.

The new Model PO air-actuated clutch is a lightweight and narrow remote-controlled friction drive. The manufacturer points out that because of its compactness, this unit can be installed in less shaft space, with closer shaft-bearing center distances. Construction features are a single set of air-cooled springs that make for distribution of release pressure, and insulated and air-cooled diaphragms of air actuation. The clutch is currently offered in 2 and 3-plate 24-inch sizes.

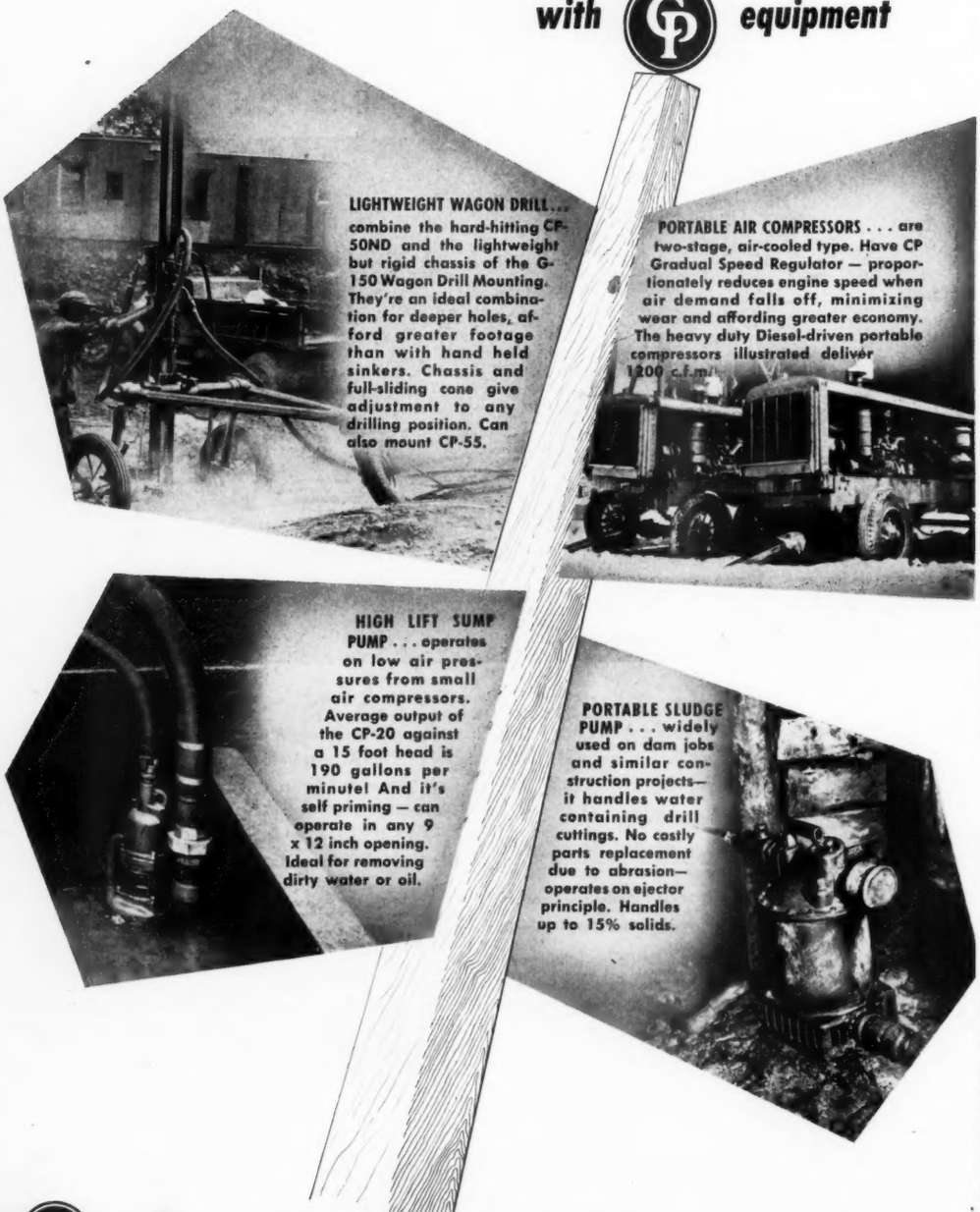
Contact the manufacturer or use the Request Card on page 18 for more facts on the air-actuated clutch. Circle No. 305.

The new disconnecting hydraulic power take-off, the Model HUD, is recommended where loads have to be lifted, swung, or twisted with frequent shocks and under high starting torque. It can be used with a gasoline, diesel, or butane engine to provide a fluid protection against starting loads, shock loads, and overloads. The unit reduces impact shocks between driving and driven equipment, and by minimizing lugging and stalling, vibrations, and torsional variations, the hydraulic device increases the operational life of the engine, chains, clutches, and other running parts.

The unit disconnects through a valve controlled by the operator. This eliminates the problem of coordinating engine throttle, drum clutch, and drum brake. The drum clutch can be engaged with engines idling and the load can be picked up by opening the throttles. Multiple engines can be synchronized while operating at slightly different speeds.

SHORTCUTS TO GREATER PROFITS

with CP equipment


LIGHTWEIGHT WAGON DRILL... combine the hard-hitting CP-50ND and the lightweight but rigid chassis of the G-150 Wagon Drill Mounting. They're an ideal combination for deeper holes, afford greater footage than with hand held sinkers. Chassis and full-sliding cone give adjustment to any drilling position. Can also mount CP-55.
PORTABLE AIR COMPRESSORS . . . are two-stage, air-cooled type. Have CP Gradual Speed Regulator — proportionately reduces engine speed when air demand falls off, minimizing wear and affording greater economy. The heavy duty Diesel-driven portable compressors illustrated deliver 1200 c.f.m.
HIGH LIFT SUMP PUMP . . . operates on low air pressures from small air compressors. Average output of the CP-20 against a 15 foot head is 190 gallons per minute! And it's self priming — can operate in any 9 x 12 inch opening. Ideal for removing dirty water or oil.
PORTABLE SLUDGE PUMP . . . widely used on dam jobs and similar construction projects— it handles water containing drill cuttings. No costly parts replacement due to abrasion— operates on ejector principle. Handles up to 15% solids.

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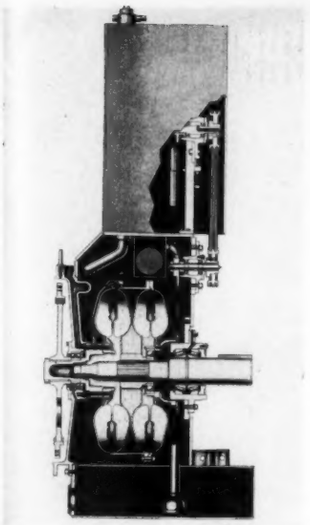


The new disconnecting hydraulic power take-off, Model HUD.

The new power take-off is available in coupling sizes 21 and 27 inches to handle up to 600-hp engines. The device has been made more compact than earlier models by the use of an integral unit which contains an independent cooling radiator, together with the necessary fan-drive and cooling-fan assembly.

To get more information on the disconnecting hydraulic power take-off write to the manufacturer or use the Request Card at page 18. Circle No. 306.

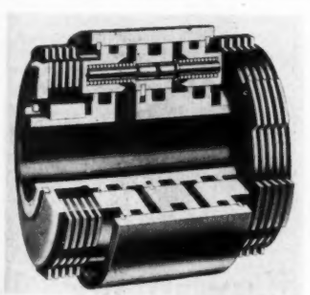
A new 2-speed oil-actuated transmission has been developed for use with 3-stage hydraulic torque converters to provide a dual range of converter operation. The unit has a direct drive and single-stage planetary gear system. Two ratio spreads are available: direct drive and 2.69:1 reduction, or direct drive and 3.07:1 reduction ratio. Hydraulically actuated multiple-plate clutches offer a selection of three operating positions: neutral, high or direct drive, and low or reduction gear drive. All positions are controlled from a spool-type valve mounted on top of the transmission.

More data on this transmission may be obtained by writing the manufacturer or using the Request Card at page 18. Circle No. 307.

A new oil-actuated multiple-plate clutch has an integral oil cylinder to clamp the plate stack. Snap rings are used extensively for easy disassembly. Advantages of the clutch are that no adjustment is needed to compensate for friction plate wear, and with no plate wear the torque capacity of the clutch for any given oil pressure is always a constant. Under these circumstances it is often possible to use a smaller clutch than usual.

As compared with the conventional mechanically actuated clutch, the oil-actuated unit offers other advantages, particularly where remote control is desired. The oil-actuated clutch has only a selector valve and a seal, whereas the mechanically actuated clutch requires a throwout fork, operating shaft, and hand lever.

For further information on the oil-actuated clutch write to the company or use the Request Card at page 18. Circle No. 308.



The Twin-Disc oil-actuated clutch.

New Plant for Wellman

S. K. Wellman Co., manufacturer of Velvetouch all-metal friction products for earth-moving, transportation, aircraft, mining, and general industrial equipment, has moved into a new plant at 200 Egbert Road, Bedford, Ohio.

The plant covers over 100,000 square feet of factory area and an additional 95,000 square feet devoted to a laboratory and office space.

APPROVED for 1-course MACADAM

RUNWAY HIGHWAY **CONSTRUCTION**

The Vibro-Tamper applies vibration and impact, gives up to 95 proctor in 2 to 3 passes. Approved by many states and Army, Navy and CAA for 1-course construction.

In waterbound work, Vibro-Tamper "runs in" screenings in as few as 2 passes—saving 50% time on spreading, brooming, and rolling.

WRITE FOR VIBRO-TAMPER BULLETIN FOR COST-SAVING DETAILS

THE INTERNATIONAL VIBRATION COMPANY

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How is this for Flexibility in an 18-in. Diameter Culvert Pipe?

This 28-ft culvert is flexing under its own weight. Made of 16-gage galvanized sheet steel, it consists of two 14-ft sections joined by a single field coupling. Its total weight is 440 lb.

Large-diameter corrugated pipe of sheet steel has a high degree of flexibility and tensile strength. These properties allow the pipe to conform to irregular grade in a trench. They mean that the pipe can absorb changing loads caused by shifting or freezing soils, without pulling apart. And they permit it to withstand the impact and vibration of overhead traffic.

In addition, this kind of pipe weighs only a fraction as much per foot as comparable pipe of other materials. It comes in longer sections that are easy to handle without special lifting equipment, and that require the minimum of field joints.

COPPER-BEARING, CORROSION-RESISTING STEEL

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel carries a heavy coating of zinc and has excellent resistance to corrosion. It more than meets Federal specifications, as well as those of the American Association of State Highway Officials.

If you would like further information on Beth-Cu-Loy, or if you would like to know who uses it in culvert pipe, write or phone any Bethlehem office.

BETHLEHEM STEEL COMPANY

BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETH-CU-LOY *GALVANIZED* **CULVERT SHEETS**

BETHLEHEM STEEL

Underseal Checks Pavement Pumping

Old Missouri Highways Are Treated With Asphaltic Filler Which Seals Cracks and Does Not Melt in Summer

Maintenance crew drills 1½-inch access holes for the filler through the concrete pavement. Later, holes are permanently closed with wooden plugs. *Houch Photo*

• ASPHALTIC filler heated to 400 degrees and pumped under cracked slabs, has about cured pavement pumping on older Missouri highways. The hot filler not only stabilizes the traffic-pounded slab but also seals the cracks from underneath as the void is filled. The filler, which has a melting point of 180 degrees, sets in about two minutes and forms a solid support which resists entry of water and does not soften under summer heat. Most underseal jobs hold up for more than a year and some have turned in several years of good service. Other bad spots have been undersealed three or four times in the last few years. Such conditions are the result of bad soil and drainage.

The Missouri Highway Department started undersealing several years ago under the direction of Rex Whitton, Chief Engineer. Now nearly all the older pavements susceptible to pumping are being treated with the filler unless the voids are extra large. Filling these large holes entirely with undersealing compound would be too expensive, so slurry was first pumped under the slabs. Undersealing operations then followed.

Pavement Pumping

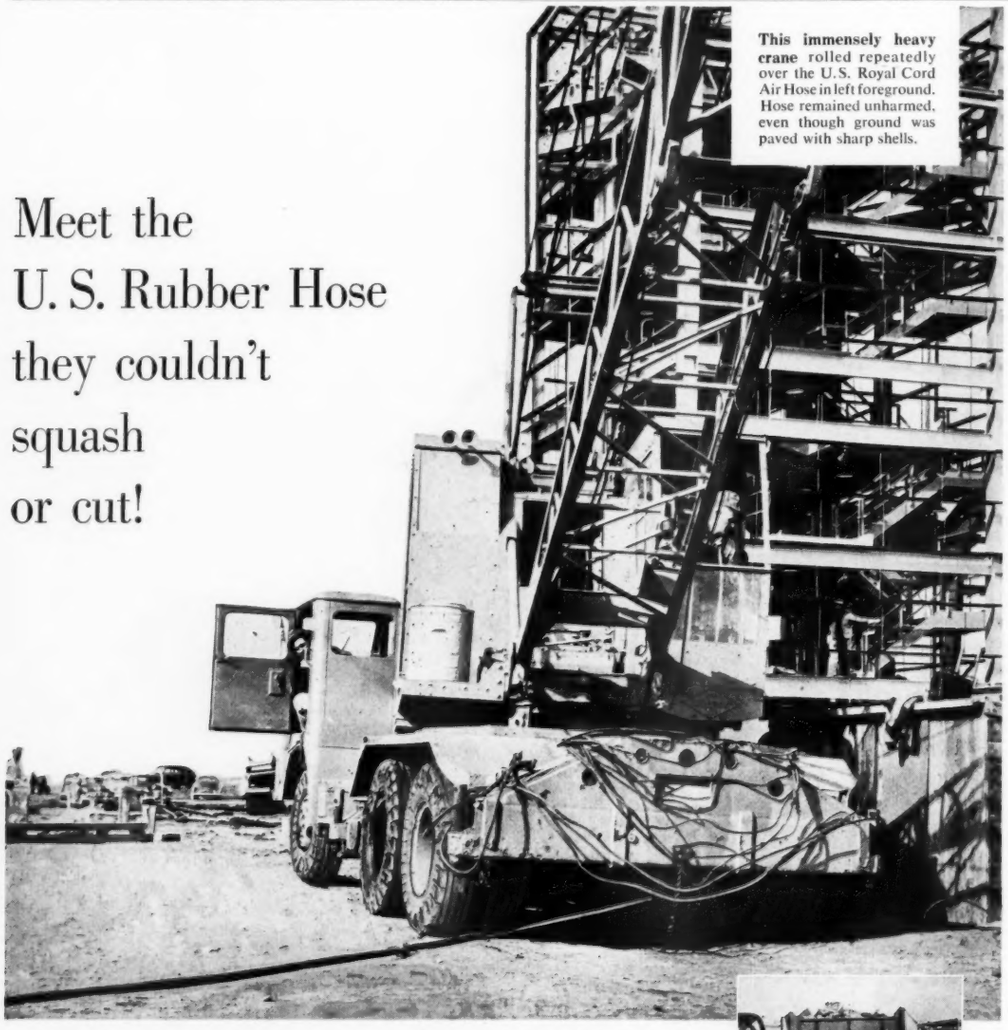
While any pavement may eventually pump, the worst offenders are the older roads with a clay base, according to Dean Wilson, Maintenance Engineer, Missouri State Highway Department. "Fine grained soils hold the water, and the deflection of the slab under traffic serves to pump the base out, leaving the pavement unsupported at joints and cracks", Dean Wilson said.

Another advantage of undersealing, Wilson pointed out, is that it can be done in winter when men and equipment are available. Undersealing reduces pavement failures and prolongs the life of the pavement.

The amount of underseal compound needed for a given road is always an unknown quantity, Wilson said. "You can't tell how much a road will take by looking at it, you've got to pump it first. Some pavements can be filled with as little as 5,000 gpm while other pavements with large voids might take more than 30,000 gpm."

If a pavement which has been badly cracked from age and traffic is given a 2-inch bituminous coating on top after undersealing, the water

Meet the U. S. Rubber Hose they couldn't squash or cut!



This immensely heavy crane rolled repeatedly over the U.S. Royal Cord Air Hose in left foreground. Hose remained unharmed, even though ground was paved with sharp shells.

In the 14 months it took to build a large aluminum plant in Texas, U.S. Royal Cord Air Hose took a beating which amazed construction men. 50-ton cranes on tractors, trucks carrying steel girders or gravel, ran over it again and again. *No cribbing was used.* The pavement was surfaced with very sharp and abrasive oyster and clam shells. Yet the hose suffered no damage, not even when carrying 125 pounds of water closed off at the end! Weathering and salt air had no effect on it. What's more, every foot of the hose is now being used in the finished plant.

If there ever was a hose you can thoroughly abuse, U.S. Royal Cord is it. You don't have to waste time and money cribbing it. Move it about at will. It's the only cord hose built with true tire construction.

This is the sort of endurance you can count on in any United States Rubber Company product. There are 25 "U.S." District Sales Offices, staffed with engineers to serve you. Or write to address below.

Constant stream of heavily loaded vehicles at considerable speed roll over the U.S. Royal Cord Air Hose on hard packed roadway. Hose suffered no damage.

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Hayward Buckets

CONTRACTORS AND ENGINEERS

Pumping hot asphaltic filler under the pavement. *Houck Photo*

Standard Steel Co. distributor truck and the undersealing crew on U. S. 65, south of Sedalia, Mo. Steam flies as the filler gun is withdrawn. *Houck Photo*

that contributed to the pumping is sealed off above and below, resulting in a new extension of life for an old road, Wilson explained.

Undersealing Contracted

Undersealing in Missouri is largely done by contract, as the job not only requires special equipment but also involves so many difficulties connected with the proper handling and heating of pavement filler, that jobs are done most satisfactorily by specialists.

How underseal jobs are handled may best be told by describing one of the jobs of the Midwest PreCote Co., of Kansas City, Mo., subcontracting under the Missouri Petroleum Products Co., of Overland, Mo., which recently completed several hundred miles of undersealing in the western part of Missouri.

Job Methods

The 7½-mile job of U. S. 65 south of Sedalia, was visited by CONTRACTORS AND ENGINEERS in late February just after it had been started. It was completed three weeks later.

Access holes for filler must be drilled through the slab to the void, and state highway forces do this ahead of the contractor. Holes usually are drilled 12 inches from the center line and along the front side of the joint or crack, the front being the direction of traffic.

There must be enough holes to make sure that all voids are completely filled. After the space is filled, sufficient pressure is applied to lift the slab slightly and allow

(Concluded on next page)

MOVING? Be sure to give us 30 days' notice of your change of address—and let us have your old as well as your new address.

Unless you do this you may skip an issue or two before the correction is made—and you won't want to be missing any issues of CONTRACTORS & ENGINEERS these days!

CONTRACTORS & ENGINEERS
470 Fourth Ave., New York 16, N. Y.

DIGGING — Contractor Del Balso of Bronx, N.Y., keeps his Model HM profitably busy. Here it's lowering grade for a new pavement . . . easily cutting the many tree roots encountered.

LOADING — Model HM doing a fast loading job on a dirt pile for Davis Construction Corp., Long Island. Fast reverse speeds and power boosted steering give this "PAYLOADER" high production on loading work.

BACKFILLING—A very popular "PAYLOADER" use is trench work — loading excess dirt and backfilling the trench. Tires do not injure pavements and the bucket can backfill over the top of sheeting or other obstructions.

SPREADING — On the Penn-Lincoln Parkway near Pittsburgh, Frank Mashuda's Model HM spreads shoulder material while concrete pouring goes on beside it. Good tire flotation and maneuverability is an important HM asset here.

MASTER OF MANY JOBS

Big 4 wheel drive "PAYLOADER" tractor-shovels are capable *and* versatile — able to do *many* jobs and drive quickly from one job to another at speeds of 17 m.p.h. Big tires, plus 4-wheel-drive, gives them catlike traction and flotation to surmount poor ground conditions. Power boosted rear wheel steer makes them maneuverable and easy to handle . . . 4 gear ratios in each direction provide the right speeds to fit each task.

The powerful 1½ cu. yd. "PAYLOADER" is the flagship of the "PAYLOADER" fleet, which includes 7 sizes down to 12 cu. ft. bucket capacity. Also a choice of 4 wheel drive, rear wheel drive and front wheel drive to best fit your needs. Your Hough Distributor, one of 200 in the U.S. and Canada, is ready to serve you *right* — with extensive application experience and complete parts and service facilities. The Frank G. Hough Co., 762, Sunnyside Ave., Libertyville, Ill.

WRITE for full information on any of the "PAYLOADER" models: FourWheel Drive HM — 1½ yd. and HR — 1 yd.; Rear Wheel Drive Models HY — 1¼ yd., HF — ¾ yd., HE — ½ yd.; Front wheel drive Models HAH — 15 cu. ft., HA — 12 cu. ft.

SAY "HUFF"

PAYLOADER®

THE FRANK G. HOUGH CO. SINCE 1920

Underseal Checks Pavement Pumping

(Continued from preceding page)

for an estimated 18 per cent shrinkage on cooling.

The hole-drilling crew, usually a mile ahead, consisted of four men and one truck towing a Jaeger 160 air compressor. Two Thor air drills drove 1½-inch holes with renewable Timkin bits. Holes are left open until slab is undersealed.

Handling Filler

Pavement filler used was Korite supplied by the Standard Oil Co., from their Sugar Creek refinery near Kansas City, where it was pumped into Standard Steel Co. and Etnyre 1,050-gallon distributor trucks at 400 degrees F. PreCote also used four Standard Steel Co. insulated trailers holding 3,000 to 4,000 gallons for transporting filler to the job where distributor trucks were refilled.

Hot filler is pumped under the pavement through the holes with a special tapered nozzle connected to the distributor pumps with armored hose. Since asphalt at such high temperatures can cause serious burns, the nozzle operator is protected against splatter by padded clothes, boots, gloves, and eye shield. After the tapered nozzle is forced tightly into the hole, the operator presses the trigger. When the asphalt starts coming out of the other holes, they are closed with long-handled sticks. When the nozzle is removed, a workman quickly closes the hole with a rake handle. After the filler sets, usually in two minutes, rake-handle plugs are removed and all holes are permanently plugged with short wooden plugs driven flush with the pavement with a sledge.

The job requires flagging but traffic resumes its normal flow when the crew leaves, thus eliminating barricades and lighting at night.

Personnel

C. H. Soper is General Superintendent for Midwest PreCote Co., which had 8 men on the job under Henry Pennington, Foreman.

H. M. Brush, Kansas City, is Division Engineer; G. B. Majors is Maintenance Engineer, Division 4; Dean Wilson is Maintenance Engineer; and Rex Whitton is Chief Engineer for the Missouri State Highway Department.

Engineering Group Elects

At the recent Annual Meeting of the Michigan Engineering Society in Lansing, Mich., the following officers were elected: William N. Kitchen, President; M. E. Malone, Secretary; Samuel D. Porter, Treasurer; D. Bradford Apted, Director-at-Large; and Joseph E. Wilbur, Executive Secretary.

The meeting was attended by 250 members of the Society.

Water-Power Project In Yugoslavia

The Yugoslav Government is making intensive efforts to develop the country's power resources. A 100-per-cent increase in power output since World War II has already been made, and this increase should double again by 1956, but even this output would represent no more than 6 per cent of the country's estimated potential if all her hydroelectric and thermal power were put to use. If all Yugoslavia's usable water power were harnessed, it is estimated that the country would have an output of 50 billion kilowatt hours a year, a hydroelectric potential about as great as that of Austria or France.

The government has two aims: one is the over-all industrial development of the country, and for this more power is a prerequisite; the other is the export of surplus power to other European countries.

Many of the streams from which Yugoslavia derives electric power are in the south, near the Adriatic coast, and have their maximum flow during the rainy winter months. The sources for most other European countries are Alpine streams, which have their maximum flow after the thaw, in late spring and summer. The government aims therefore to construct hydroelectric plants along the Adriatic coast and to build transmission lines to feed power to other countries when their hydroelectric output is at its lowest and the demand for energy at its peak.

Under the auspices of the United Nations Economic Commission for Europe and on the initiative of the government of Yugoslavia, joint studies have been made on the possibilities of such international transmission of electric power.

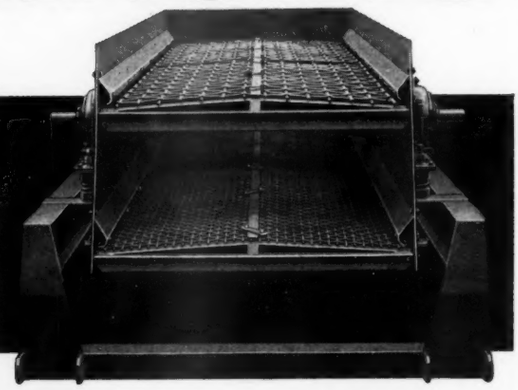
Other potential sources of power have also been assessed. Wood was previously the source of half the energy consumed in Yugoslavia, but it is now essential to conserve timber for manufacture. Coal mines are in operation, though on a small scale. Experiments are being made on methods of increasing the efficiency of lignite, a soft low-grade coal that has recently been discovered in large quantities. Metallurgical coke, also, is being developed for use in the iron and steel industry. Oil potential is not large, but the country's requirements are low, and to cover them an industry is developing to follow up explorations made by the Germans along the Rumanian border.

Certainly the greatest power potential in the country lies in its water resources, and it is in this field that the most rapid development is taking place. The Technical Assistance Administration of the United Nations Economic Commission for Europe is collaborating with the Yugoslav Government to set up a program of work for this development project.

ANNOUNCING

Diamond's

5 ft. wide VIBRATING screens



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1—2—2½ and 3 DECKS

for ANY INSTALLATION

SPECIFICATIONS

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- Adjustable spring balance cups
- Screen clamp bars over center supports
- 5/16" side plates
- 3/16" throw on shaft

SHAFT DIMENSIONS

4½" at main bearing
5¼" at pitman bearing
5¾" between pitman bearings
3 7/16" shaft at flywheel

Write for full engineering details today. For other vibrating screens from 2 x 5 to 4 x 14, ask for "DIAMOND SCREENS AND WASHERS" bulletin.

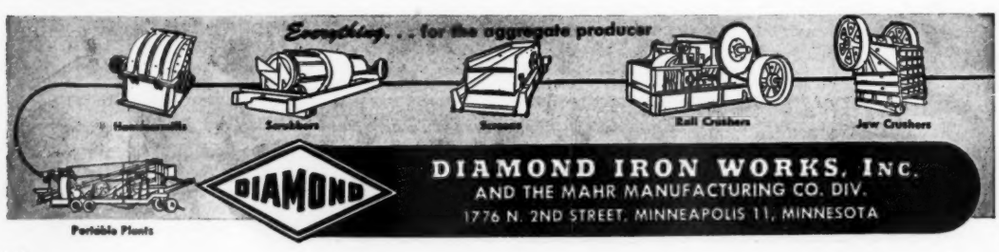
FEATURING DIAMOND'S NEW SIDE PLATE CONSTRUCTION!

FIELD TESTED for the past two years, Diamond's new series of 5′ wide vibrating screens give you high production, low operating and maintenance costs, and freedom from work stoppage. Diamond's new method of reinforcing the side plates at the shaft eliminates vibration. Heavy steel plates between the bearings double the side plate strength.

Positive vibrating action plus plenty of headroom between decks give faster separation of material over entire screening area. Aggregate moves quickly from top to bottom of screen, using gravity through Diamond's inclined screen construction, to maintain a high rate of production without clogging.

EASILY EQUIPPED FOR WASHING AGGREGATE

Vibrators may be easily equipped with spray bars for washing sand and gravel during the screening operation. Screens can be driven with "V" or flat belt drive.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Convention Calendar

June 15-19 ASCE Meeting
Summer Meeting, American Society of Civil Engineers, Casablanca Hotel, Miami, Fla. Don P. Reynolds, Assistant to Secretary, 33 W. 39th St., New York, N. Y.

June 18-20 Professional Engineers Society
Annual Meeting, National Society of Professional Engineers, Sheraton-Beach Hotel, Daytona Beach, Fla. Kenneth E. Trombley, 1121 15th St. N. W., Washington 5, D. C.

June 22-26 Engineering Education Society
Annual Meeting, American Society for Engineering Education, University of Florida, Gainesville, Fla. Prof. John C. Reed, Chairman, University of Florida.

June 23-25 Modern Highway Conference
Professional Conference, Massachusetts Institute of Technology, Cambridge, Mass. Write Room 3-107, M. I. T., Cambridge 39, Mass.

June 29—July 3 ASTM Meeting
Fifty-sixth Annual Meeting, American Society for Testing Materials, Chalfonte-Haddon Hall, Atlantic City, N. J. R. J. Painter, Executive Secretary, ASTM, 1916 Race St., Philadelphia, Pa.

July 12-15 Association of County Officials
Meeting, National Association of County Officials, Sheraton Plaza, Boston, Mass. Keith L. Seegmiller, Secretary-Treasurer, 1616 Eye St. N. W., Washington 6, D. C.

August 17-21 Shade Tree Conference
National Shade Tree Conference, La Salle Hotel, Chicago, Ill. L. C. Chadwick, Secretary-Treasurer, Department of Horticulture, Ohio State University, Columbus, Ohio.

August 21-23 Seabee Veterans Meeting
Meeting, Seabee Veterans of America, Fowler Hotel, Lafayette, Ind. Leonard Ade, Convention Chairman, 1816 E. Main St., Lafayette, Ind.

Waterproofing Additive

A cement additive for integral waterproofing is announced by Shield Chemical Corp., 251 Grove Ave., Verona, N. J. Drycrete, which is a non-water-soluble liquid is said to make cement, concrete, or stucco waterproof. It is recommended by the manufacturer for such uses as parging and mortar, for foundations, walls inside and out, and concrete bridges.

Other properties claimed include bonding to block or brick, without the need for lath or furring on inside walls; paintability; reduction of shrinkage and cracking; and easier working for the mason.

For further information write to the company, or use the Request Card at page 18. Circle No. 264.

Bulk-Material Feeders

A line of reciprocating plate feeders for handling loads of bulk material from dump trucks is shown in a catalog from the McLanahan & Stone Corp., Hollidaysburg, Pa. The units are used to feed uniform controlled quantities from trucks, hoppers, or storage bins to crushers, washers, and conveyors. The feeders can be synchronized with production capacity covering a wide range.

Sizes available are 16 x 48 inches to 72 x 93 inches.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 294.

Highest Engineering Enrollment at Ill. Tech.

A report issued by the American Society for Engineering Education reveals that the Illinois Institute of Technology in Chicago enrolls more engineering students than any other educational institution in America.

The Institute for the past seven years has been accommodating more engineering students than any of the other 193 schools throughout the nation which are accredited by the Engineers' Council for Professional Development. Engineering enrollment totals 4,621 undergraduates and 920 graduate students.

Second and third largest engineering enrollments in the country are at Brooklyn Polytechnic Institute, with 3,190 undergraduates and 1,050 graduate students; and Purdue University, with 3,808 undergraduates and 313 graduate students.

A hydraulic Hydra-Lift mounted on a Chevrolet C. O. E. model is used here by the Gary-Hobart Water Corp., in Miller, a Gary, Ind., suburb. The lift, whose controls on the dash are operated by the driver, saves time and labor in laying heavy water lines.

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* PORTLAND—636 N. W. 18th Ave., Portland 9, Oregon
** EXPORT DEPARTMENT—8 South Michigan Ave., Chicago 3, Illinois

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Portable Belt Conveyor

A trailer-mounted belt conveyor formerly made by the Meili-Blumberg Corp., is now manufactured by the Goldbeck Metal Products Co., New Holstein, Wis. The conveyor, still designated the M-B, has a steel receiving hopper and sideboards for handling bulk materials.

Four models are available in lengths from 13 feet 2 inches to 25 feet 2 inches. The units are powered with either a gas engine or electric motor. A hydraulic lift adjusts the conveyor to desired loading height. The trailer mounting is optional.

For further information write to the company, or use the Request Card at page 18. Circle No. 172.

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Easy to apply transfer signs, more durable and attractive than hand lettered. We make your design to fit our standard 20" x 30" panel. Your company name, type of business, phone number and address in gold or silver lettering. Also panel 6" x 30" to fit limited space on some equipment with company name only. If you have 4 units or more, it will pay you to write today for detailed information.

BING TRANSFER SIGNS
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New Road-Roughness Recorder Is Used on Missouri Highways

• EIGHTY-SIX test sections of Missouri highway are being checked by the State Highway Department with its new roughness-recording machine with the expectation that the tests will lead to a new yardstick of roughness standards for road acceptability. These special test sections, scattered over the state, are being checked for progressive and comparative roughness resulting from age and traffic conditions. Other new and old highways and roads under construction are also being checked for purposes of comparison in the expanded study of pavement life.

Missouri's road-roughness recorder is the newest of road-surface measuring machines stemming from the first machine built more than ten years ago at Iowa State College, Ames, Iowa, from Bureau of Public Roads designs, and contains a number of improvements, most of which were copied from Minnesota's design. It was built in the Bureau of Equipment shops at a cost of $5,265, which was shared by the Bureau of Public Roads. One of only six in the country, it reads road surfaces with uncanny precision and the variation factor, long a bugaboo of such machines, has been reduced to almost zero.

Uses

Such machines have been largely used only to indicate a need for reconstruction or corrective treatment, but with elimination of the variation factor its readings may be used more as acceptable standards for new construction.

Minnesota uses its machines to determine acceptability by checking highways during and after construction. This state also has the highest minimum requirements for highway surfaces which are pegged at less than 75 inches of roughness per mile. Above 100 inches is graded poor and between 75 and 100 is considered only fair.

Figures gathered from all the experiments in all states using the roughometer rate 400 inches per mile as very rough, 200 as rough, 100 poor, and below 100 passable. Some highways in California have been constructed with a roughness factor as low as 40 inches per mile. These were portland cement concrete with surfaces finished by a succession of smoothing and planing operations in which as many as 8 passes were made. Hot plant-mix pavements in Virginia have been finished with a rating of 56 to 60 inches per mile with credit for the exceptional smoothness going to superior workmanship with asphalt-finishing machines, and to the use of flat rollers which ironed out almost all surface irregularities.

Back of the development of this machine are two factors: the public's habit of judging the quality of a road by its riding qualities, and the engineer's need for a reliable method of measuring these qualities.

J. J. Corbett, Missouri Engineer of Construction, said the machine is expected to raise the standards of workmanship and improve the skill of machine operators. Contractors, too, may compare the oscillographs of their highways with that of others, and highway engineers may be able to specify materials, equipment, and other components known to make for a definite surface quality.

The Missouri machine produces two records on the paper ribbon of

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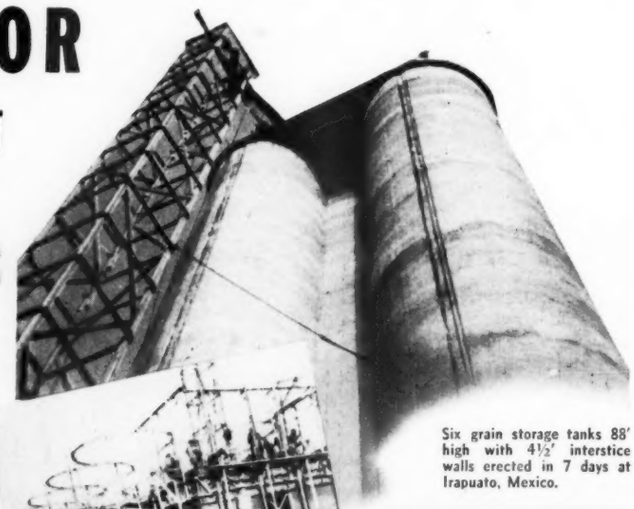
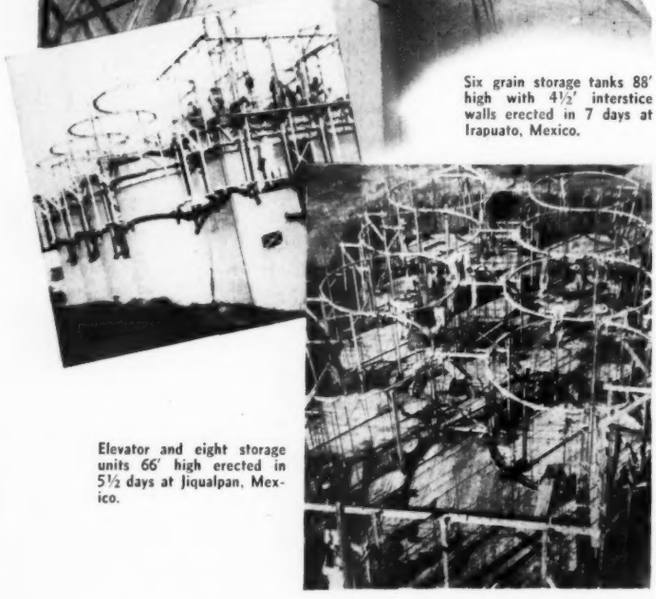


Six grain storage tanks 88' high with 4½' interstice walls erected in 7 days at Irapuato, Mexico.



Elevator and eight storage units 66' high erected in 5½ days at Jiqualpan, Mexico.

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A road-roughness recorder determines surface acceptability during one of the State Highway Department's tests in Missouri.

the oscillograph. The top line profiles the up-and-down movement of the test wheel while the lower pen writes a cumulative graph of each 250 feet of pavement.

Construction

Essentially, the machine consists of a standard tire buffed to perfect roundness and mounted on an automobile wheel centered in a 26½ x 96-inch steel frame. The up-and-down movements of this wheel are converted into electrical impulses and are transmitted to the oscillograph inside the tow truck.

The recorder is towed by a panel truck at 20 mph when making test runs. Speed is registered on a special speedometer, calibrated and clustered in the cab with two electric counters which record inches of roughness and wheel revolutions. The truck contains the electrical equipment and space for hauling the recorder when not in use. The crew consists of a driver and an operator, and no flagging is required.

The Missouri study is under the jurisdiction of S. M. Rudder, Engineer of the Highway Planning Bureau, and R. L. Meads, engineer on special assignment.

Barrows Improved

Trays on contractors' wheelbarrows, made by Jackson Mfg. Co., Harrisburg, Pa., are now interchangeable. Another improvement made on the barrows is the substitution of a higher leg. The new leg raises the grip end of the handles approximately 3 inches. The manufacturer points out that this reduces the amount of bending necessary to grip the handles, and also makes it easier to pick up the barrow while it is loaded. The distribution of the load is more quickly placed on the wheel rather than the laborer.

For further information write to the company, or use the Request Card at page 18. Circle No. 225.

Evans Joins G-E Welding

F. H. Evans, formerly an assistant to the manager of manufacturing in the Meter and Instrument Department of General Electric Co., Schenectady 5, N. Y., has been named Manager of Manufacturing for the company's Welding Department.

Mr. Evans joined G-E in 1937. After serving in the armed forces from 1942 to 1946, he returned to G-E as foreman, superintendent, and assistant to the manager of manufacturing.

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Kellogg Magazine Editor

Virginia Campbell is the Editor of a new 16-page magazine published bi-monthly for employees of M. W. Kellogg Co., Jersey City, N. J., engineer contractor of petroleum refinery and chemical plants.

Miss Campbell was previously Assistant Editor of *Avisco News*, monthly magazine for employees of American Viscose Corp., and before that a reporter-photographer on a daily newspaper in Burlington, Vt.

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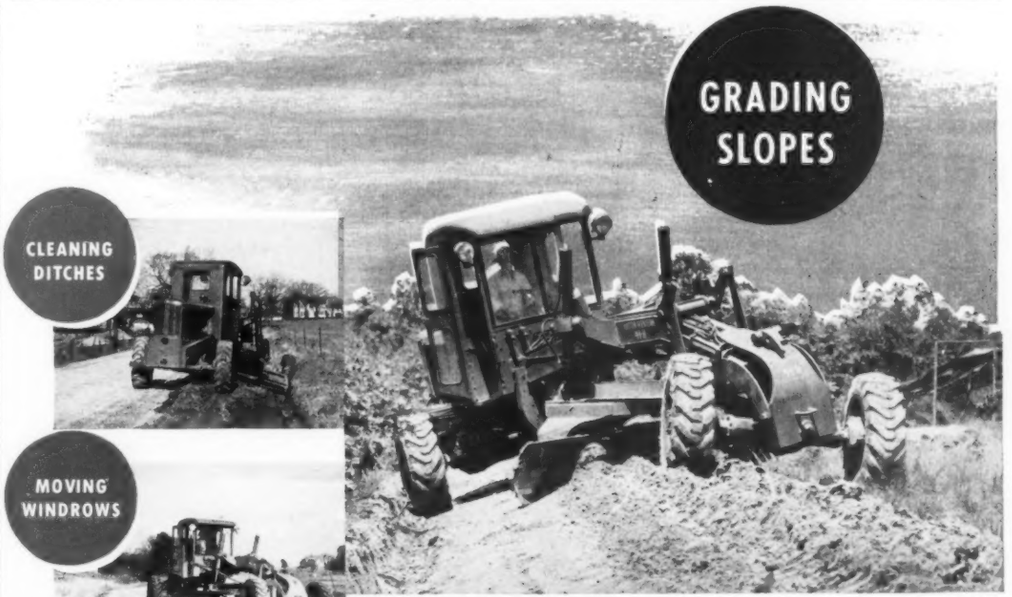

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The new Manco angle-iron cutter operates hydraulically, weighs 80 pounds, is portable, and has a capacity of 2½ x 2½ x 5/16 inches.

Angle-Iron Cutter

A new angle-iron cutter is announced by the Manco Mfg. Co., Bradley, Ill. The Guillotine cutter is said to cut with a straight clean shear, and causes no deformation of the angle-iron end. The unit is available in portable models with hand-pump hydraulic action for field erection work. Electric hydraulic pumps are available for production cutting.

Capacity of the Guillotine Model A-20-B is 3 x 3 x ¼ inches or 2½ x 2½ x 5/16 inches. The manufacturer states that the cutter does not have to be bolted down or otherwise mounted for operation.

Adaptations of these units are also available for cutting special shapes such as channel or H-beam.

For further information write to the company, or use the Request Card at page 18. Circle No. 189.

Booklet on Conveyor Belts

A new 32-page manual on the installation and maintenance of conveyor and elevator belting has just been released by the B. F. Goodrich Co., Akron, Ohio. More than 60 photographs and drawings illustrate ways to improve belt service and to lengthen belt life.

A chapter on how to select belts includes a discussion of belt design, covers, reinforcements, and grades. Belt repair methods, and belt splicing and fastening are also covered.

The company's Turnover conveyor-belt system for handling wet, corrosive, sticky, or freezing material is described. A table lists common conveyor-belt maintenance problems, their causes, and remedies.

Other topics covered in detail include ways to make conveyor belts run straight, the causes and effects of excessive tension, the selection and installation of pulley lagging, ways to avoid belt wear at the loading point, use of damage-preventing appliances, types of compensating idlers, and the effects of defective idlers.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 284.

NLMA Loses Frank Alcott

Frank Hart Alcott, for 17 years a building codes consultant and structural engineer for the National Lumber Manufacturers Association, died on March 16 after a heart attack at his home in Jamaica, N. Y. He was 62.

Mr. Alcott's engineering career included serving as an assistant consulting engineer for the National Board of Fire Underwriters in New York from 1924 to 1928, as Secretary-Manager of the New York Lumber Trade Association from 1932-1937, and as Public Relations Manager for the Red Cedar Shingle Bureau from 1937 to 1939. He was a licensed professional engineer in New York and a member of several engineering and building societies.

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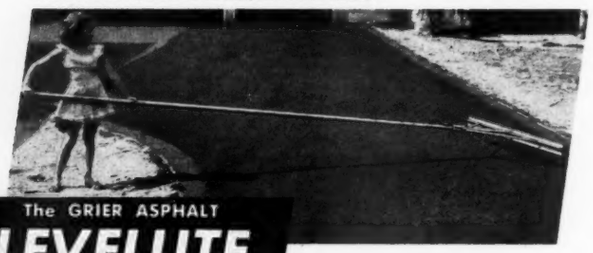

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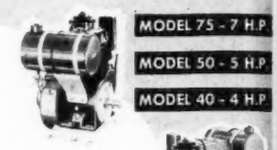

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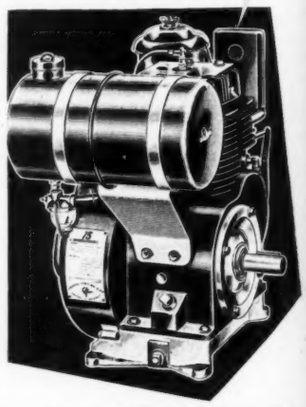

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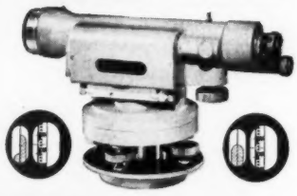

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Precast Slab and Tile Co. Gets Permalite Franchise

Exclusive Permalite franchise has been granted by Great Lakes Carbon Corp., Los Angeles, Calif., to Precast Slab and Tile Co., St. Louis, Mo., manufacturer of precast perlite concrete products. Expansion of perlite products will be made possible through a combination of resources and the recent acquisition by Perlite Division of Great Lakes Carbon Corp. of Alexite Engineering Division of Alexander Film Co., including the Alexite perlite mine and plant in Colorado. Alexite perlite ore will now be mined and processed by Great Lakes Carbon Corp., and expanded and marketed, under the trade name Permalite, by Precast Slab and Tile Co.

The national sales agency for Perlite Division will be J. J. Brouk & Co., St. Louis. J. John Brouk, President of the company, is also President of Precast Slab and Tile Co.

Stainless Steel Wire

Technical data on stainless steel wire is available from Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa. Tables of physical properties, corrosion resistance, and analysis are included.

A discussion of the principal uses of stainless wire covers cold heading, weaving, heat-resisting belts, rope, spring wire, slide forming, welding, and winding.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 287.

Shannahan Is Secretary

Cornelius M. Shannahan has been appointed Director-Secretary of the Building Contractors' and Mason Builders' Association of Greater New York, Inc., an organization of 90 general contractors.

Mr. Shannahan will have temporary headquarters in the offices of H. M. Hughes Co., Inc., 15 E. 41st St., New York, N. Y.

Concrete-Forming Panels

New literature is available on ready-made concrete-forming panels and accessories. The steel-framed Uni-Form panels are aligned and braced on one side only. Other features are an outside corner angle and Panel Loc clamps that make corners accurately.

The folder also shows the company's line of form ties, concrete specialties, and reinforcing-bar supports.

To obtain this literature write to the Universal Form Clamp Co., 1238 N. Kostner, Chicago 51, Ill., or use the Request Card at page 18. Circle No. 182.

DISTRIBUTORS

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ALASKA—Philpott Equipment Co., 573 Dexter Horton Bldg., Seattle 4, Washington.

ARIZONA—Lively Equipment Co., Albuquerque, N. M. State Tractor & Equipment Co., 407 S. 17th Ave., Phoenix.

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Maritime Newfoundland Agencies Ltd., P. O. Box 822, Halifax, N. S.

COLORADO—Constructors Equipment Co., 3707 Downing St., Denver 5.

CONNECTICUT—The W. I. Clark Co., 2196 Dixwell Ave., New Haven.

DELAWARE—L. B. Smith, Inc., Camp Hill, Penna.

FLORIDA—Florida-Georgia Tractor Co., 2806 W. Beaver St., Jacksonville; 2418 State Rd., Lakeland; 3139 No. Miami Ave., Miami; 1400 S. Orange Blossom Trail, Orlando; New Quincy Highway, Tallahassee; 210 S. 12th St., Tampa.

GEORGIA—Tri-State, Inc., 880 Glenwood Ave. S.E., Atlanta 1; East Side Highway, Macon; Olive Rd., Augusta; 712-16 No. Washington St., Albany.

HAWAII—Grace Brothers, Ltd., 770 Ala Moana Road, Honolulu 10, Hawaii.

IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 No. 4th St., Pocatello.

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The Euclid Road Machinery Co., Hibbing, Minn.

MINNESOTA—The Euclid Road Machinery Co., Highway 169 West, Hibbing.

MISSISSIPPI—Euclid-Memphis Sales, Inc., Memphis 2.

MISSOURI—Euclid Sales & Service, Inc., 5231 Manchester Ave., St. Louis 10.
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NEW YORK—Hubbard & Floyd, Inc., 151st St. & Gerard Ave., New York 51.
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North Carolina Equipment Co., P. O. Box 880, Greenville; P. O. Box 1206, Charlotte; Sweeten Creek Rd., Asheville; P. O. Box 128, Guilford; P. O. Box 695, Wilmington.

NORTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

OHIO—The W. W. Williams Co., 835 Goodale Blvd., Columbus 8; 18301 Brookpark Rd., Cleveland 11; 914 Main St., Cincinnati 2; 1250 Conant St., Toledo (Maumee).

OKLAHOMA—Butler-Sparks Equipment Company, Oklahoma City and Tulsa.

OREGON—Intermountain Equipment Co., Boise, Idaho.
P. L. Crooks & Co., 2145 N.W. Pettygrove St., Portland.

PENNSYLVANIA—Atlas Equipment Corp., 635 Ridge Ave., Pittsburgh 12.
Standard Equipment Co., 152 Horton St., Wilkes-Barre; Hepburn & Lycoming Sts., Williamsport.
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RHODE ISLAND—Clar.-Wilcox Co., Boston 34, Mass.

SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.

SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

TENNESSEE—Euclid-Memphis Sales, Inc., 185 E. Butler Ave., Memph s 2.
Power Equipment Co., 1218 Island Home Ave., Knoxville; 600 W. Manning St., Chattanooga; 121 Clay St., Kingsport.

TEXAS—The Euclid Road Machinery Co., 1007 Levee St., Dallas 2.
Lively Equipment Co., P. O. Box 1438, El Paso.

UTAH—Foulger Equipment Co., 1361 So. 2nd West, Salt Lake City 8.

VERMONT—Clark-Wilcox Co., Boston 34, Mass.

VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th and Killam Ave., Norfolk.
Rish Equipment Co., 1601 Chamberlayne Ave., Richmond 10; 405 Center Ave. N.W., Roanoke 7.

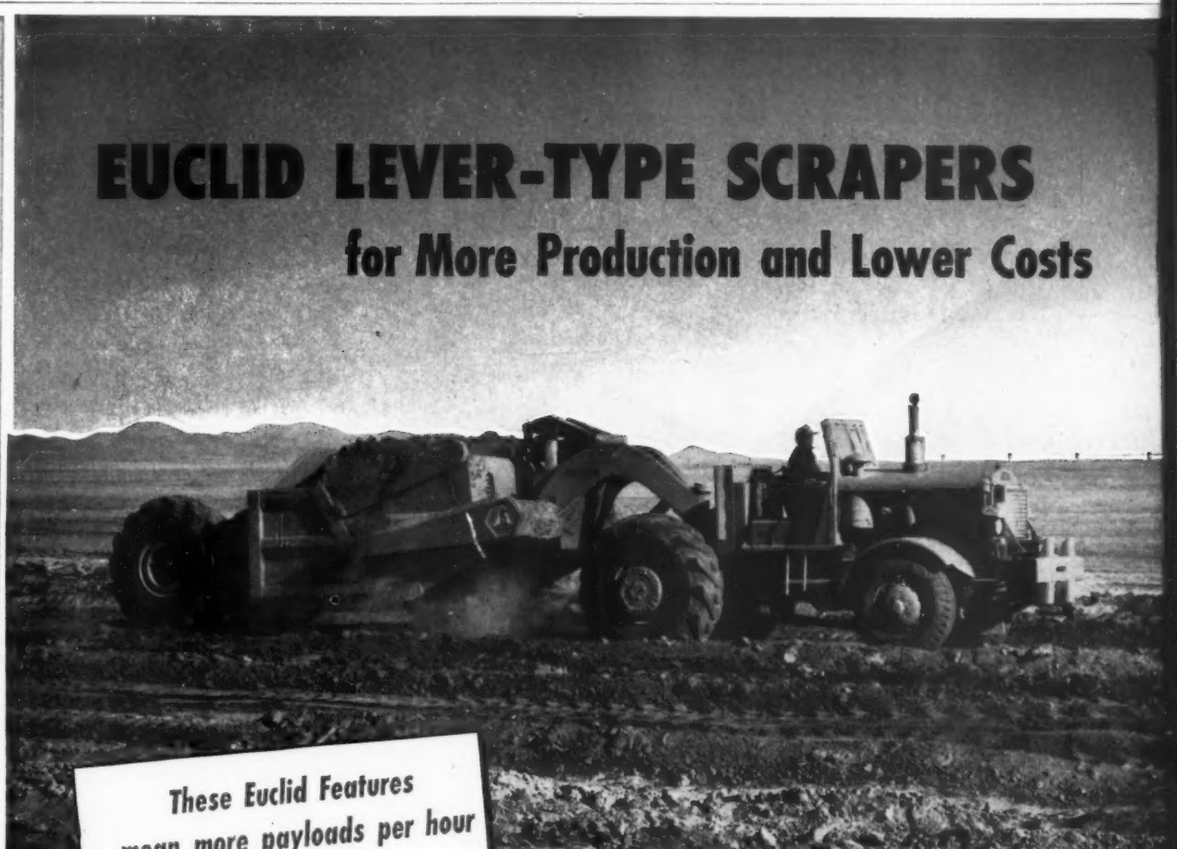
WASHINGTON—Philpott Equipment Co., 573 Dexter Horton Building, Seattle 4, Washington.
P. L. Crooks & Co., Portland, Oregon.
Intermountain Equipment Co., E. 911 Sprague Ave., Spokane 5.

WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh.
Rish Equipment Co., Kanawha Blvd., Charleston 22; East on U.S. 50, Clarksburg; P.O. Box 309, Bluefield.
L. B. Smith, Inc., Philadelphia, Penna.

WISCONSIN—Cunningham-Ortmayer Company, Milwaukee 46, Eau Claire and Green Bay.

WYOMING—Constructors Equipment Co., Denver 5.
Foulger Equipment Co., Salt Lake City 8, Utah.

EUCLID LEVER-TYPE SCRAPERS
for More Production and Lower Costs



15.5 cu. yds. struck — 18 cu. yds. heaped at 3:1 — 21 cu. yds. at 1:1

These Euclid Features mean more payloads per hour

- Stability and Safety of the 4-wheel tractor.
- Independent control of all Scraper operations.
- Lever actuated controls.
- Only 12 feet of cable.
- Simplified, compact hydraulic system with interchangeable jacks.
- Reversible, interchangeable cutting blades.
- 10-speed transmission . . . 28 m.p.h. with full payload.

Outperforms all other scrapers of comparable size!

Lever action, an exclusive Euclid development, is the most important advancement in Scraper design and performance in many years. Hydraulic jacks, each interchangeable with the other, operate levers that control the cutting edge, bowl and apron lift, and the positive roll-out ejector. No more down time due to broken cables . . . there is only one 12′ length of cable, used for the apron lift, on the scraper.

The choice of leading contractors because of their high job availability, "Euc" Scrapers are now better than ever in production and low cost performance! Ask your Euclid Distributor for information on this new model!

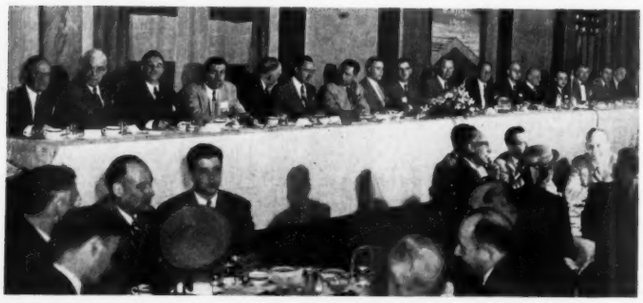
The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

EUCLID THE PIONEER

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Distributor Doings



The head table at the opening luncheon meeting of the Canadian Association of Equipment Distributors, at which Mayor Camillien Houde was guest speaker.

Canadian AED Holds Tenth Annual Meeting

A broad varied program was covered at the Tenth Annual Meeting of the Canadian Association of Equipment Distributors held from April 13 through 15, at Mount Royal Hotel, Montreal, Canada. An opening luncheon, with Mayor Camillien Houde of Montreal as guest speaker, was followed by a number of business sessions and social functions. Of the 141 names registered, 41 came from the United States, including all the Associated Equipment Distributors' Executive Committee.

Executive Committee Business

During the convention, several meetings of the national executive committee were held, where the following plans for the AED program for the remainder of the year were established:

The firm of Stevenson, Jordan, & Harrison, Consulting Engineers, New York, N. Y., was appointed to make a statistical survey of distributor financing methods and a further survey of management methods. A profit-planning manual was authorized, to be published about July 1. Further publication plans were made for a new (sixth) edition of the Rental Rates Manual in the fall. This edition will cover the varied replies which have been received from a nation-wide survey.

Executive committee discussions also included a review of plans for regional meetings and for the next annual AED convention, to be held at the Waldorf-Astoria Hotel, New York, N. Y., probably on February 1, 1954. A report regarding the AED group-insurance plans in which over 100 distributors are participating, was discussed.

Region 15 Business

In order to operate on a national scale, giving service of greater value to the membership consisting of 81 active and 38 allied members, it was decided that the Canadian AED (Region 15) headquarters be established at Ottawa, Ontario.

An address on "Special Tariff Arrangements on Construction Equipment" by S. D. C. Chutter, Assistant Manager of the Canadian Construction Association, dealt with the growing invasion of Canada by "foreign" contracting firms who are carrying out projects throughout the country. The question was raised as to whether Canada might not institute regulations—similar to those in other countries—whereby construction work would be handled by domestic firms. Since the Association is committed to the system of free enterprise, the CCA has not sought to exclude foreign contractors through regulation. Instead, it is impressing on owners the advantages of engaging Canadian firms who are familiar with climatic, labor, and material conditions. On the whole, Mr. Chutter summarized, the CCA welcomed capital, skill, and fair competition as being to the country's best interests.

Mr. Chutter revealed that applications made to the Canadian government by American contractors to send equipment into Canada on a temporary basis, paying a duty of one-sixtieth of the customs tariff per month, are referred to the CAA. The Association is asked to report if such equipment is available in Canada, not too distant from the job. Within the last several months, in only half the cases has the temporary importation been granted.

Danger of Rental Contracts

S. J. Oechsle, President of the AED, pointed out that the Association has proved its value to member companies in the United States. At the beginning of the Korean crisis, the Corps of Engineers, U. S. Army, prepared a rental contract that might have put the distributors out of business. The Association was instrumental in preparing a proper contract, and has since been called for advice when plans are formulated. Mr. Oechsle declared that "sales and selling and the building up of a sales division are important. Distributors must plan for profits. They cannot afford to give away their

You can rely on Dewey and Almy construction products

You get *dependable* performance from Dewey and Almy products for the construction industry. You get it where it counts most — in the field, on the job. For each Dewey and Almy product is a result of years of down-to-earth research and field-tested quality controls.

The extensively equipped Dewey and Almy Cement and Concrete Laboratory is not an "ivory tower" . . . it is a *practical* proving ground that mirrors actual field conditions. Even more important, Dewey and Almy engineers are practical men with the *experience* to translate today's test results into specifications for tomorrow's improvements.

Get acquainted with Dewey and Almy products for the cement and concrete industries. See why engineers and contractors all over the world rely on them for their most important projects.

DAREX AEA • World's most widely used brand of air entraining agent. Concrete made with DAREX AEA places easier, finishes faster and better, has finer surface texture, is many times more durable when exposed to freezing and thawing.

AIRALON • A ready-to-use air entraining agent and plasticizer that contains all the ingredients necessary to make a superior masonry cement.

DARASEAL • Creates a "membrane" film — keeps water in newly placed concrete for better, more complete curing.

GRINDING AIDS • Catalyzing grinding aids for cement mills that increase grinding rates of Type 1 cement 15 to 20%; of Type 2 cement 20 to 25%; of Type 3 cement 25 to 50%.

DARACONE • Long-lived silicone water repellent for above grade exterior masonry walls. Effectively combats efflorescence and leaks without affecting the appearance or "breathing" qualities of the masonry.

DEWEY and ALMY
Chemical Company
Cambridge 40, Mass.
Plants and sales offices throughout the world

services without remuneration. Credits and collections in the United States are slowing up a good deal in some territories. Within six months sales may be considerably harder to make. Better ethics is the keystone of the AED."

Since rental purchases are often a subterfuge to avoid cash down payment, most members agreed that such purchases should be regarded as conditional sales and should be entered as sales in their books.

Conclusion

Other addresses stressed the importance of good roads in Canada, the significant role of the small business man, and a suggested standard warranty which could clearly state the rights and responsibilities of the manufacturer, the distributor, and the purchaser.

CAED officers elected for 1953-1954 are: President, R. S. Hamilton, Sheridan Equipment Co., Ltd., Toronto; First Vice President, M. F. MacDonald, F. H. Hopkins & Co., Ltd., Montreal; and Second Vice President, D. C. Campbell, Tractors & Equipment Ltd., Fredericton, New Brunswick.

New Warco Distributor in Ohio

Gibson-Stewart Co., with offices and plants in Cleveland and Columbus, Ohio, will be distributors of Warco motor graders in all of Ohio, excepting Belmont, Jefferson, Mahoning, and Columbiana counties, it has been announced by W. A. Riddell Corp., Bucyrus, Ohio.

Gibson-Stewart is also distributor of earthmoving, concrete paving, and blacktop equipment throughout Ohio. W. H. Stewart is Vice President and General Manager of the company, and E. M. Spangler is Sales Manager in Columbus.

Western Tractor & Equipment Co., with offices in Chehalis, Evert, Hoquiam, Tacoma, and a main office at 2230 1st Ave., Seattle, Wash., has been named to Riddell's Warco road graders in the state of Washington.

Howell Changes Name

L. Z. Howell Co., Inc., has legally changed its name to Howell Equipment Co.

Howell Equipment Co., located at 7443 S. Racine Ave., Chicago 36, Ill., distributes the following: International Harvester gasoline and diesel engines, rubber-wheel tractors, and all types of parts; Schramm air compressors and parts; Ready-Power generator sets and parts; D. W. Onan generator sets and parts; Novo pumps and parts; and trailers made by Transport Trailers, Inc.

Buck Expands Sales

Buck Equipment Corp., Cincinnati, Ohio, manufacturer of automatically portable, heavy-duty hoisting machines and self-dumping concrete buckets, has appointed 13 new dealers since the beginning of 1953.

The distributors are: Alberto Walliser & Cia., Ltda., Correo Aero No. 631, Madellin, Colombia, South America; Leary & Owens Machinery Co., Inc., 3600 5th Ave. N., Birmingham, Ala.; Clark Equipment Co., Inc., P. O. Box 2619, Cantrell Rd. and Booker, Little Rock, Ark.; Gridley Equipment Co., 1524 Long Beach Ave., Los Angeles 21, Calif.; Harry's Crane Service, 1245 E. Adam St., Jacksonville, Fla.; A & W Engineering Co., P. O. Box 96, Riverside Station, 2222 N. W. 14th St., Miami, Fla.; R. F. Messina Co., Inc., 1411 S. Broad St., New Orleans 15, La.; Construction Machinery Corp., 1830 Clairborne Ave., P. O. Box 277, Shreveport, La.; Dale & Rankin, Inc., 23 Sussex Ave., Newark 4, N. J.; J. B. Hunt & Sons, Inc., Raleigh, N. C.; State Machinery & Supply Co., 1005 Meeting St., West Columbia, S. C.; C. H. Jones Equipment Co., 1595 S. Second W., Salt Lake City, Utah; and Star Machinery Co., 1741 First Ave., Seattle 4, Wash.

Jewel A. Benson, President of Benson Tractor Co., in his new office.

New Benson Plant

Benson Tractor Co., 9100 Block, Almeda Road, Houston 21, Texas, has recently opened a larger plant with greatly expanded facilities.

The company is a distributor for Carco winches, Baker bulldozers, Gar Wood scrapers and bulldozers, Tractomotive loaders, and Allis-Chalmers tractors, power units, and

(Continued on next page)

there's a *BIG* difference ...in this 3/4 yd. shovel!

Look beyond the dipper size when you investigate your next 3/4-yard shovel. Shovels may be rated the same, may even look alike, but that's where similarity ends when you look at the 3/4-yard Lorain TL-25.

Look into the cab to see if power flows directly and efficiently from the engine to the point of use, as it does on the "TL-25" . . . or *does* power wear itself out in long gear trains or in bending itself around corners?

Look to see if it has a great quantity of duplicate and interchangeable parts . . . does it have "packaged components" to permit quick switching of all major components. The "TL-25" *does* have these for easier service and quicker maintenance . . . another reason why it stays on the job longer.

Look at what it does on the job. *Dirt in the truck* means more than a whole slew of "talking-points". If you believe *actions speak louder than words,* you'll like the "TL-25" because it is on performance that it really shines. Your nearest Thew-Lorain distributor will be glad to prove these statements.

3/4 yards of power *plus* . . .
Whether gas or diesel, it goes to work directly . . . tears in the job . . . and consistently turns out profit-earning yardag

3/4 yards of speed *plus* . . .
You can capitalize on every bit of "TL-25" power because operation it responds with lightning speed, has high acceler tion that kills "drag", and is a muscle-saver for the operato

3/4 yards of endurance *plus* . .
Anti-friction bearings, oil-enclosed gears, 5 identical sh clutches, drop-forged hook rollers . . . and other items highest quality materials and workmanship assure "TL-25 stick-to-it-iveness on the job.

3/4 yards of selection *plus* . . .
No other machine in *any* class offers such a selection of boom and mountings to hit your job right-on-the-button. Select fro 4 crawler sizes, 7 rubber-tire mountings, 7 interchangeable booms.

THEW LORAIN TL 25

THE THEW SHOVEL CO., LORAIN, OHIO

Distributor Doings

road building machinery.

Jewel A. Benson is President of Benson Tractor, and O. R. Brodgon is the Vice President and Sales Manager.

New G-E Distributor

Consolidated Welding Supplies, Inc., 1939 Tulane Ave., New Orleans, La., has been named G-E welding distributor for the New Orleans-Baton Rouge area by the Welding Department, General Electric Co., Schenectady 5, N. Y.

The company, which will handle the complete line of G-E welders, electrodes, and accessories, is managed by two American Welding Society members, C. A. Young. Jr., and W. B. Blackwell.

Ted R. White, crusher specialist for Brown Co.

Crusher Specialist for Brown Co.

Ted R. White has been appointed crusher specialist for Herman M. Brown Co., Des Moines, Iowa, construction equipment distributor for Iowa.

Before joining the Brown Co., Mr. White was District Representative for 18 years with Universal Engineering Co., now a subsidiary of Pettibone Mulliken Corp., Chicago, Ill., manufacturer of all types of gravel-crushing, screening, and washing plants.

Cleco Distributors

Cleco Division of Reed Roller Bit Co., Houston, Texas, has appointed the following distributors for Cleco products in their areas: F. C. Bishop Co., Inc., P. O. Box 21, Station H, Buffalo, N. Y.; Flood & Calvert, Inc., 2314 Strand, Galveston, Texas; and Paterson Machinery Co., 309 Seventh Ave., S. Nashville 4, Tenn.

Cleco manufactures the Cleco and Dallett lines of air tools and accessories, including tools for construction, manufacturing, metal fabrication, foundries, industrial maintenance, and stone carving.

New A. O. Smith Distributors

Welding Products Division of A. O. Smith Corp., Milwaukee, Wis., announces the addition of three new distributors of welding electrodes, machines, and accessories. They are: Pensacola Welding Supply Co., Inc., Pensacola, Fla.; Worland Oxygen Co., Worland, Wyo.; and Guildford Welding Supply Co., Baltimore, Md.

Mustang Moves Plant

Mustang Tractor and Equipment Co. has recently moved to a new location at 7777 Washington Ave., Houston 7, Texas.

The company is a distributor for Caterpillar tractors, and other machinery and equipment.

ANNOUNCING

Profit TRENCHER

PIONEER RUBBER-TIRED WHEEL TRENCHER

Now Available for Your Own Installation on Your Tractors!

Ford • J. I. Case (VA-VAI) • Ferguson

Install it yourself on your present Tractor!

First and Only Trencher with Front Mounted Loader-Dozer.

First and Only Trencher with Front Mounted Arms for stripping and lowering pipe.

First and Only Rubber-Tired Trencher with Finger Tip Reversible and Adjustable and Variable speed conveyor.

First and Only Rubber-Tired Trencher with wide-range Creep and Bucket line digging combinations.

First in Field —First with wide range of patentable features for your profit.

"PROFIT TRENCHER EQUALS 45 MEN!"

Look at these outstanding PROFIT TRENCHER features and discover why users make such statements. Digs 12" to 24" wide—up to 60" deep, absolutely square bottom trench conveyor discharges soil to right or left; sixteen forward trenching combinations suit all soil conditions; rubber tired mobility means on and off the job *fast* —no need for trailer transportation—four road speeds provide up to 18 m.p.h. between jobs! Front mounted PROFIT LOADER has an inter-changeable bucket and angle dozerblade, so one man—with one machine—can trench, then load the excess dirt or backfill the ditch to complete the job.

The superior all around unit for cities, gas, telephone, water and power utilities, contractors, plumbers, oil fields, etc., etc. "Proven by five years' world-wide service, all conditions."

You'll be amazed at the surprisingly low cost of this combination unit. See your CPC PROFIT SYSTEM distributor or write for details.

Courtesy Discount to Dealers

FREE! Bulletin 150 describes PROFIT TRENCHER

CONSTRUCTION PRODUCTS SALES

4043 Goodwin Avenue — Los Angeles 39, California

UP and READY to go in 23 minutes!

BUCK

Automatically-Portable Heavy-Duty HOISTING MACHINE

CONTRACTORS REPORT THESE AVERAGE SAVINGS OVER OTHER HOISTS!

Cost per job OTHER HOISTS

Moved in . . . erected . . . dismantled and removed — by 2 to 5 men in a matter of hours — at cost of $200.00 to $400.00 per job.

Save hundreds of dollars on move after move!

Cost per job BUCK HOIST (automatically-portable)

Moved in . . erected . . lowered and removed —by one man—at cost of only $30 per job!

Here's Why the BUCK Automatically-Portable, Heavy-Duty Hoisting Machine Saves You Time and Money on Job after Job:

AVERAGE SAVING $170 to $370 PER MOVE over other hoists!

Easily towed — even by a pickup truck — your BUCK is pneumatic trailer mounted . . . has finger-tip balance. One man makes the move — quickly . . . easily!

Ready-rigged, self-erecting, self-lowering tower unfolds like a jack-knife. It's the only complete automatically-portable, heavy-duty hoisting machine in the world!

Completely set up and ready to operate in only 23-minutes . . . instead of hours! One man does the whole job! It raises 2000 lbs. at 100 feet a minute.

Self-dumping ½ cu. yd. BUCK Concrete Bucket and 12-ft. Chicago-type boom available.

Let us prove how YOU can save $170 to $370 a job — over other hoists. Ask for an on-the-job demonstration today.

CHECK YOUR BUCK DEALER TODAY— or write direct to BUCK

ALABAMA, Birmingham
Leary & Owens Machinery Co., Inc.
ARKANSAS, Little Rock
Clark Equipment Co., Inc.
CALIFORNIA, Los Angeles
Gridley Equipment Co.
CALIFORNIA, San Francisco
Beatty Safway Scaffolds, Inc.
CONNECTICUT, Waterbury
Contractor's Supply Co., Inc.
FLORIDA, Jacksonville
Harry's Crane Service
FLORIDA, Miami
A & W Engineering Co.
GEORGIA, Atlanta
W. C. Caye & Co., Inc.
ILLINOIS, Oak Lawn
Tractor and Equipment Co.
INDIANA, Indianapolis
Reid-Holcomb Company, Inc.
IOWA, Sioux City
Safway Steel Scaffolds Co.
KENTUCKY, Louisville
Embry Brothers, Inc.
LOUISIANA, New Orleans
R. F. Messina Co., Inc.
LOUISIANA, Shreveport
Construction Machinery Corp.
MARYLAND, Baltimore
Equipment Rental Co.
MASSACHUSETTS, Boston
Marr Scaffolding Co.
MICHIGAN, Detroit
Safway Steel Scaffolds, Inc.
MICHIGAN, Grand Rapids
Vos Equipment Co.
MINNESOTA, Minneapolis
Safway Steel Scaffolds Co.
MISSISSIPPI, Jackson
Equipment Incorporated
MISSOURI, Kansas City
Funkhouser Machinery Co.
MISSOURI, St. Louis
George F. Smith Co., Inc.
NEW JERSEY, Newark
Dale & Rankin, Inc.
NEW YORK, Albany
Albany Ladder Co., Inc.
NEW YORK, Buffalo
Builders Rental Equipment
NEW YORK, Syracuse
Builders Rental Equipment
N. CAROLINA, Raleigh
J. B. Hunt & Sons, Inc.
OHIO, Columbus
E. W. Harmon Co.
OKLAHOMA, TULSA
Butler-Sparks Equipment Co.
PENNSYLVANIA, Philadelphia
Alliance Equipment Co.
PENNSYLVANIA, Pittsburgh
Equipment Rental Co.
S. CAROLINA, W. Columbia
State Machinery and Supply Co.
TENNESSEE, Memphis
Tri-State Equipment Co., Inc.
TEXAS, Dallas
Safway Scaffolds Co. of Texas, Inc.
UTAH, Salt Lake City
C. H. Jones Equipment Co.
VIRGINIA, Roanoke
Southern Machinery & Supply Co.
WASHINGTON, Seattle
Star Machinery Co.
WASHINGTON, D. C.
Hudson Supply and Equipment Co.
WISCONSIN, Milwaukee
Stone Manufacturing Co.
COLOMBIA, S. A., Medellin
Alberto Walliser & Cia. Ltda.

BUCK EQUIPMENT CORP.

208 BUTLER STREET CINCINNATI 2, OHIO

Distributor Doings

Air Rentals Is Distributor

A newly formed organization, Air Rentals, Inc., 3301 Walnut St., Denver, Colo., will be a distributor for Gardner-Denver construction equipment.

Robert H. Pearson, who has been associated with Gardner-Denver Co., Quincy, Ill., for 37 years, is retiring as Vice President of the company to assume management of Air Rentals, Inc.

Air Rentals, specializing in equipment and supplies for rock contractors, quarry operators, and mines will distribute the following Gardner-Denver products: portable air compressors, rock drills, breakers, tampers, spaders, sump pumps, line oilers.

Waco Distributor

Wilson-Albrecht Co., Inc., manufacturer of Waco sectional steel-scaffolding equipment, has named Bacon-Wolforth Corp., 41-18 38th St., Long Island City, N. Y., as its exclusive distributor in New York City, Long Island, and Westchester counties.

The firm will merchandise Wilson-Albrecht ground scaffolding, mason and scaffold jacks, material-hoisting towers, and portable elevators, on a rental and sales basis. Albert S. Bacon, President of Bacon-Wolforth, will also head the new Waco division. John H. Wolforth will direct sales.

New Wood Distributors

Wood Mfg. Co., North Hollywood, Calif., manufacturer of Wood road-building equipment, has appointed Power Equipment Co., Knoxville, Tenn., as distributor for eastern Tennessee, and Cary Hall Machinery Co., Salem, Va., for the state of Virginia.

Dimond-Colloton Distributes

Dimond-Colloton Equipment Co. has been appointed distributor of equipment for Joy Mfg. Co., Pittsburgh, Pa., makers of air compressors, wagon drills, hand-held drills, paving breakers, spaders, tampers, and portable hoists.

Dimond-Colloton has shop and sales facilities at 4257 N. 124 St., Milwaukee, Wis., and will cover most of the state of Wisconsin.

Equipment Dealers, this is your department, so send your news—all about your new plants, new lines handled by your company, and new staff appointments.

Wage and Tax Calculator

A new tax calculator has up-to-date income-tax-withholding data and computes the social security tax to be withheld for wages earned.

Coulter's Wage and Tax Calculator is divided into wage rate schedules listing wages earned for any given hourly wage rate in half hour steps up to 60 hours. The overtime at time and one half, and premium wages, as well as total wages earned are also shown.

A loose-leaf binder holds the wage-rate sheets which are covered with celluloid jackets for protection against wear. Individual charts may be purchased as needed.

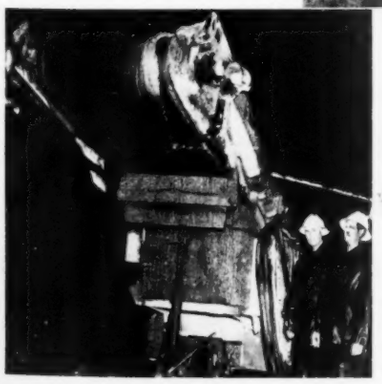
For further information write to the Ensee Sales Co., P. O. Box 673, Roanoke, Va., or use the Request Card bound in at page 18. Circle No. 312.

Specify GOODALL for the Big Jobs that Must Move on Schedule

GOODALL BELTING can be relied upon to "keep the job moving", frequently with record-making speed and efficiency, as in the situations described below. Developed especially for contractors' use, these belts continually demonstrate their unsurpassed strength and durability under severest working conditions.

"SUPER TRIPLE-S" CONVEYOR BELTING

Goodall's finest . . . made to carry the heaviest loads, *longer*. Illustration shows part of more than two-mile installation of "Super Triple-S" and other Goodall belting on Detroit Dam construction.



"WEAR KING" MUCKER BELTS . . .

Built to provide record-making strength and stamina, as demonstrated on the 7,042-ft. railroad tunnel at Bingham Canyon, Utah, where some of these belts handled over 35,000 cu. yds. of material without replacement.

Contact Our Nearest Branch for Details

GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.

Branches: Philadelphia • New York • Boston • Pittsburgh • Indianapolis • Chicago • Detroit • St. Paul • Los Angeles • San Francisco • Seattle • Spokane • Portland • Salt Lake City • Denver • Houston • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities

Est. 1870

Dirty Work AT THE CROSSROADS

When big equipment starts nudging through Alabama clay, Alaska mud or Michigan gravel, there's a Shunk blade on tap helping to do the dirty-work.

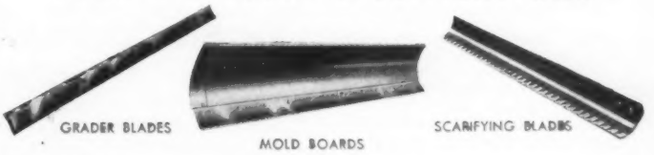
It's built tough to be tough.

Contractors like the Shunk blade for its superior quality and its ability to spread maintenance and construction costs, as well as its ability to spread aggregate and dirt.

Distributors favor a Shunk blade thanks to its 98-year development background, improved Shunk service, and high quality.

More information is yours for the asking.

3000 DIFFERENT SPECIFICATIONS



WRITE FOR OUR NEW CATALOG

Shunk MANUFACTURING COMPANY

In Our 99th Year

BEST BLADES MADE

BUCYRUS, OHIO

A newly imported drawing-ink fountain pen with fifty-eight interchangeable nibs is suitable for technical drawing, sketching, stenciling and lettering. The Pelican Graphos will draw a uniform line from hairline thickness to ⅜ of an inch. For further information write to John Henschel & Co., Inc., 105 E. 29th St., New York 16, or use the Request Card at page 18. Circle No. 234.

Fractional Hp Motors

Two new fractional-horsepower motors for applications requiring moderately high starting torque have been announced by the Fractional Horsepower Motor Department of General Electric Co., Schenectady 5, N. Y.

Rated at ½ and ¾ hp at 1,725 rpm, the new motors can be mounted in any position, and are easily reconnectable at the terminal board for 115 to 230 volts. They are smaller and lighter in weight than the corresponding general-purpose units of comparable ratings, according to the manufacturer.

The motors have starting currents which conform to NEMA standards.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 282.

Line of Grader Attachments

A new booklet lists twenty attachments for Caterpillar motor graders. Pictures and text cover a variety of items including blades, blade extensions, a shoulder finisher, a hydraulic steering booster, large front tires, scarifiers, bulldozers, an odometer, a lighting system, a cab, and several snow wings. Fifteen of the attachments are made by Caterpillar and five by other companies.

To obtain this literature write to Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 256.

Eichwald Firm Formed

A firm of consulting engineers, Eichwald Associates, with offices in New York, N. Y., and New Haven, Conn., has been formed, with Bernard Eichwald as Coordinator.

Mr. Eichwald has had varied experience in the construction field; he has worked as draftsman and specification writer, field superintendent and chief engineer, and vice president and director of technical and administrative services. He has also handled electronic equipment installation in New York City.

Decals for Machinery

An alternative to lettering trucks is the use of decals made up to your specifications. The contractor tells the manufacturer what information he wants on the sign and then approves a sketch submitted by the company.

Bing transfer signs are made with a flexible lacquer. They are said to last indefinitely, and according to the manufacturer, they will not dry out or crack in storage.

The signs come in a number of color combinations.

For further information write to Bing Transfer Signs, 3500 W. 11 Mile Road, Berkley, Mich., or use the Request Card at page 18. Circle No. 254.

Warco Motor Grader Film

A new picture in color on the Warco 4D-100 motor grader manufactured by W. A. Riddell Corp., Bucyrus, Ohio, is available for free showings to company executives and field men, public works officials, and organizational meetings. Make your requests to the company, or to Warco distributors throughout the country.

The film, shot at Riddell's proving grounds and on actual jobs in the field, covers operational features of the Warco machine.

Hard-Facing Electrodes

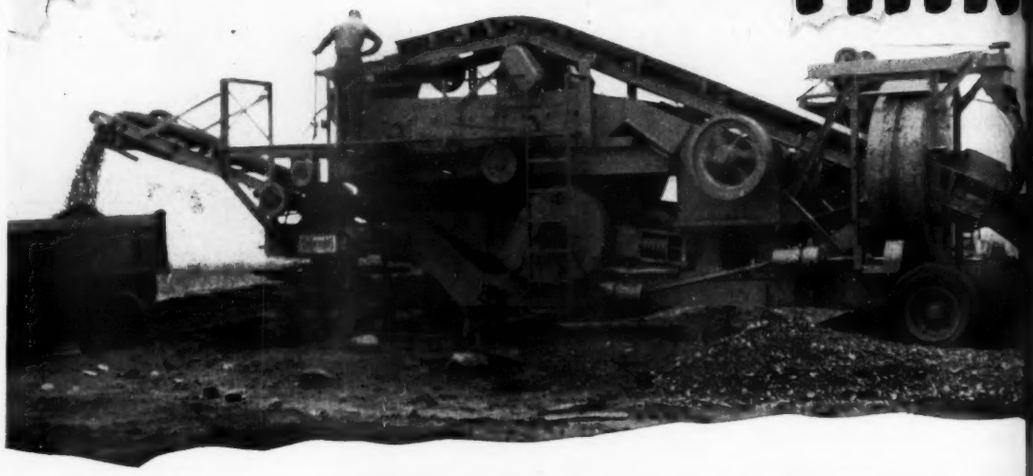
Hard-facing electrodes are covered in literature from the Mir-O-Col Alloy Co., Inc., 308 N. Avenue 21 Los Angeles 31, Calif. The company offers rods for work that will withstand varying degrees of abrasion and impact. Specialized electrodes are made for building rip welds and for tractor repair, among other uses.

This literature describes a 2-spool attachment for using combinations of wires to rebuild rollers and idlers for tractors and shovels.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 180.

THINK BIG... to mee

THINC

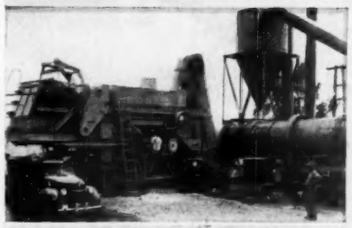


ANOTHER Cedarapids PRODUCT

THIS CEDARAPIDS COMMANDER PLA

is doing a whale of a job for Schultz and Lindsay Constru Company on tough crushing and screening jobs in North Da It's no wonder they're enthusiastic about Commander perform They say they especially like the design ratio of the jaw and crushers, screen and conveyors. They also like the high scre capacity and the extreme portability of this compact unit.

THINK CEDARAPIDS . . when you think of bituminous mixi

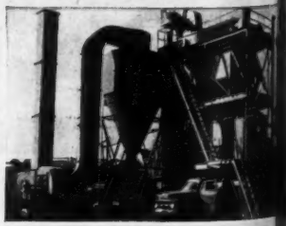


MODEL FA

The most portable batch type bituminous mixer in the Cedarapids line. The FA can be set up for operation in a matter of hours. Centralized controls insure fast, easy, one-man operation. Balanced coordination of every part produces up to 800 tons per day of accurately weighed and uniformly mixed aggregates and bitumen. Quality-built for long-term service at lowest cost.

MASTER PLANT

This two unit continuous-mix plant combines the Cedarapids Master Mixer and Gradation Control Unit to supply specification mix in big volume. The mixing unit is offered with either a twin shaft mixer which conforms to all existing specifications, or a single shaft mixer designed for high speed, vigorous mixing.



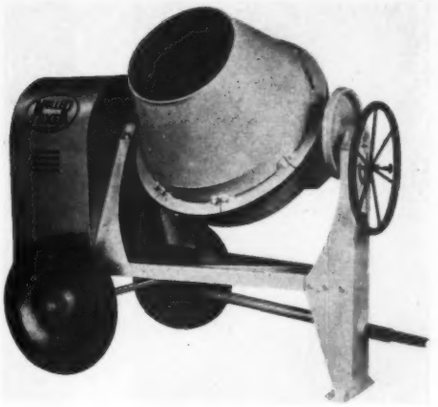
MODEL E

Two tons at a batch is average produc this Cedarapids Bituminous Mixing Plant electric operation plus automatic time signal lights and air controls insure accuracy of mix and profitable produc low-bidding contractors.

Concrete Curb Clamps

Steel clamps used in the construction of concrete curbs are shown in a bulletin from Pacific Engineering Sales Co., 3938 Wilshire Blvd., Los Angeles 5, Calif. The 2-piece self-locking clamps can be used in the construction of concrete curbs on the existing slab without drilling holes. They are used with wood curb forms. The clamps are adjustable for any curb width from 4 to 10 inches, for any height up to 36 inches, and any batter.

To obtain this literature write to the company requesting Bulletin No. 151, or use the Request Card at page 18. Circle No. 297.



The new Muller 6-S tilting concrete mixer has a capacity of 9 cubic feet of loose materials or 6 cubic feet of mixed concrete, making it unnecessary to split a bag. It is powered by a Briggs & Stratton gasoline engine rated at 7.7 hp at 2,700 rpm. For further information write to Muller Machinery Co., Inc., P. O. Box 248, Metuchen, N. J., or use the Request Card at page 18. Circle No. 249.

New Multi-Use Table

An accessory table for use in making combination angular and straight-line cuts on shapers, milling machines, and grinders is offered by South Bend Lathe, 114 E. Madison St., South Bend 22, Ind. When used on a drill press, it accurately spaces drilled holes. The drill press can be converted to a light milling machine by chucking an end mill. By attaching the table to the face of a lathe, spaced holes for jigs and die blocks can be bored with micrometer accuracy.

The unit consists of identical upper and lower tables. The upper table may be removed when it is not needed. Both the upper and lower slides have a maximum travel of 4 inches and revolve on graduated swivels to reduce height if desired. The two feed screws have micrometer collars reading in thousandths of an inch. Each precision-ground work table is 4 x 8⅞ inches and has four slots for clamp bolts.

For further information write to the company, or use the Request Card at page 18. Circle No. 277.

New Books on Carpentry

Two illustrated books on the uses of portable electric tools may be had without charge from Porter-Cable Machine Co., 22 Exchange St., Syracuse, N. Y.

One book, whose title is "Operating Electric Routers, Planes and Shapers", gives instructions for the use of these tools in a variety of practical woodworking jobs. There are 48 pages and over 100 illustrations.

"Operation of Electric Saws" contains information on advanced uses of the portable power saw and its numerous accessories in the building and remodeling of homes.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 260.

Lettering Machine

A folder shows a typewriter-like machine that can do the lettering in engineering drawings. The Vari-Typer has hundreds of interchangeable type fonts with type sizes ranging from 6 to 18 point. In addition to letter-style type, regular print styles are also available.

The machine, which is said to work 4 to 5 times faster than hand lettering, is particularly recommended by the manufacturer for the time it saves a skilled draftsman.

To obtain this literature write to the Ralph C. Coxhead Corp., 720 Frelinghuysen Ave., Newark 5, N. J., or use the Request Card at page 18. Circle No. 197.

Gardner-Denver News

A new building has just been completed for the Tulsa, Okla., branch office of Gardner-Denver Co., Quincy, Ill., manufacturer of pneumatic equipment for mining, construction, petroleum, farming, and industry.

The building is 5,000 square feet in area, and provides display rooms, district offices, and warehouse space.

The Tulsa branch covers Oklahoma and parts of Kansas.

...creasing demands for aggregate

...CEDARAPIDS...

...OR BIG-VOLUME

...RODUCTION *LIKE THIS*—

420 TONS PER HOUR on a job crushing ⅞" minus wet material containing 19% clay, with 15 to 20% crushing, was average production for this Cedarapids Commander Plant owned by Schultz and Lindsay Construction Company of Fargo, North Dakota.

300 TONS PER HOUR on ¾" material, with a heavy crush of 40 to 50%, was the Commander's production average on Schultz and Lindsay's crushing job at Garder, N. D.

440 TONS PER HOUR! Schultz and Lindsay's Commander Plant consistently averages this tonnage on lighter crushing jobs where all conditions are favorable.

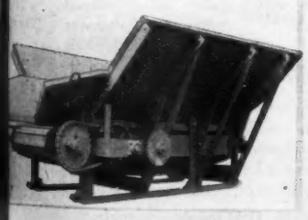
WITH the Cedarapids Commander on your job, you can *Think Big* in terms of exceptionally high tonnage output to meet today's increasing aggregate requirements. If you are a producer who needs greater output of fine-crushed products, or if your pit conditions put a bigger load on the secondary crusher, the Cedarapids Commander is designed specifically for you!

The sizes of the crushing units, screen and conveyors are accurately balanced for maximum production. The big 30" x 22" Roll Crusher steps up secondary crushing capacity to produce greater quantities of smaller size aggregates. The big screening capacity of the 48" x 10' Horizontal Vibrating Screen accurately balances the high percentages of secondary crushing. Conveyors are 30" wide to handle the high hourly output. *And the Commander's operating and maintenance costs remain as low as on other Cedarapids Plants!*

Talk to enthusiastic Commander owners... watch a Commander in operation... your Cedarapids distributor can tell you where there's one working near you, and give you complete details of all the reasons why you'll command the field with a Cedarapids Commander.

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U. S. A.

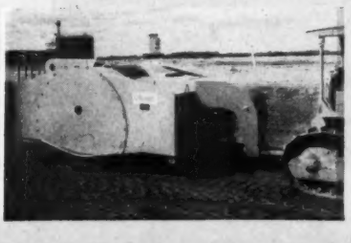


CEDARAPIDS FEEDERS

...darapids Apron Type or Reciprocating Feeders ...ntrol the feed, prevent choking and provide ...mooth, workable flow of material to crushers, ...nveyors and bucket elevators, eliminating ...verloads and surges. Available in a wide ...riety of sizes for all types of aggregate or ...ulsimous mixing plants.

VIBRATORY SOIL COMPACTORS

Here's the way to get maximum compaction on highway subgrades and bases, airport runways, or any soil and graded aggregate construction. Cedarapids Vibratory Compactors, operating on an entirely new principle, provide an impact-compacting action that reaches, and often exceeds, specified densities in one or two coverages, with less labor and lower costs.



MOTORIZED HEAD PULLEYS

Here's a money-saving departure from conventional conveyor drives. With Motorized Head Pulleys, *everything* is contained inside the drum, completely protected from grit, dirt and weather, with no outside parts or motors to service. 70% to 90% of conveyor trouble and downtime eliminated when you convert your belt conveyor or belt-bucket elevator installations to *motorized* efficiency!

Irrigation Culvert—Work progresses on a section of the Chandler Canal, built to bring water from Prosser Dam to 14,000 acres of land in southeastern Washington. J. A. Terteling & Sons, Inc., Boise, Idaho, handles ready-mix concrete with a Link-Belt truck crane.

Electro-Osmosis—Form work in this powerhouse intake tunnel proceeds without difficulty as the electrically-stabilized silt walls stand straight up without shoring. Wellpoint Dewatering Corp., New York, N. Y., used the new electro-osmosis system of cathode and anode well-points to permit deep excavations in the dry only a few hundred feet from Michigan's Saginaw River.

another slugger in the OUTPUT lineup

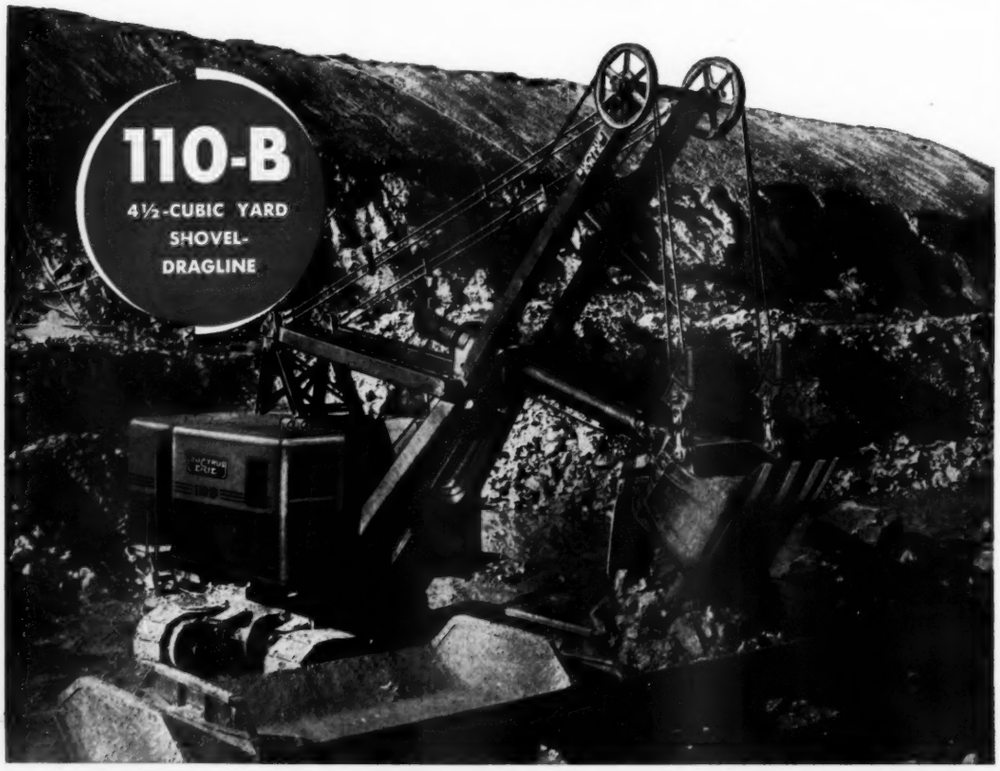
Now — taking its place in the outstanding line of Bucyrus-Erie heavy-duty quarry and mine excavators is the field-proved 4½-yard 110-B — a convertible shovel-dragline which can give you bigger output in rock, ore, or dirt at lower cost than any other machine of like capacity on the market today.

Like the larger 150-B (6-yard) and 190-B (8-yard) machines, the 110-B features Bucyrus-Erie's exclusive shovel front end. The strong, light two-section boom reduces weight and speeds digging cycle, yet provides ample strength for tough digging. Tubular dipper handle, free to rotate in saddle block, permits digging with one corner of dipper without introducing torsional strains. Powerful effective rope crowd reduces swing inertia because crowd machinery is located on revolving frame. And, twin-dual hoist ropes concentrate power where needed to pull dipper through toughest banks.

Before you buy any machine in the 4½-yard range, investigate the 110-B. It will give you consistently large ouput at lowest cost per yard. For detailed information, write today for Bulletin 110-B-1. 4L53C

BUCYRUS ERIE

SOUTH MILWAUKEE, WISCONSIN



Welding Head Shield Made of Plastic

A new arc-welding head shield has a pliable headband made of plastic. The band of the Lincoln Comfort-Shield fits the head in the same way a hat does. It is made to fit both around and over the head, and can be put on with one hand. The manufacturer points out that the plastic material does not dry out and curl up.

The normal chin strap has been eliminated. Adjustable stops on each side of the headband limit the drop of the helmet to any point desired by the welder. The stops prevent the shield from hitting the nose or chin when welding vertically or overhead. The fibre shield itself is molded in one piece.

Clearance around the head permits free circulation of air. The shield takes the standard size 2 x 4¼-inch lens and glass.

For further information write to The Lincoln Electric Co., P. O. Box 5758, Cleveland 17, Ohio, or use the Request Card at page 18. Circle No. 296.

Simple
ACCURATE
Dependable

cenco

ENTRAINED AIR INDICATOR

This device measures the percentage of air entrained in fresh concrete mixtures. Provides a simple, accurate determination by the pressure method as developed in the laboratories of the Portland Cement Association. Meets requirements of ASTM standard method C-231. Equipment includes all accessories needed for test.

cenco Light weight—portable.

Ask for circular No. 1212C

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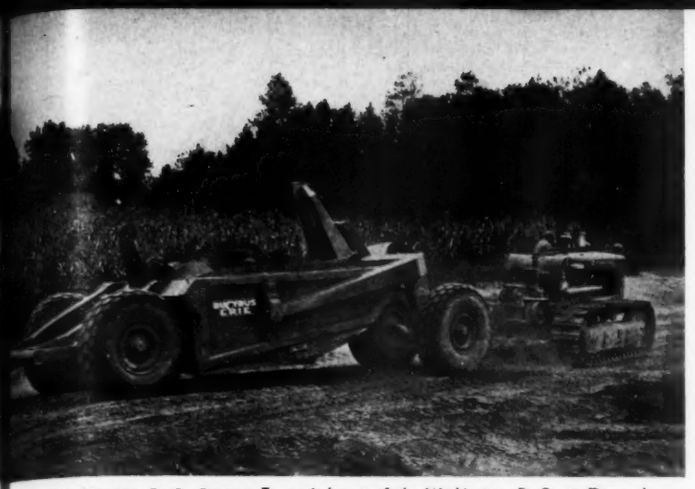
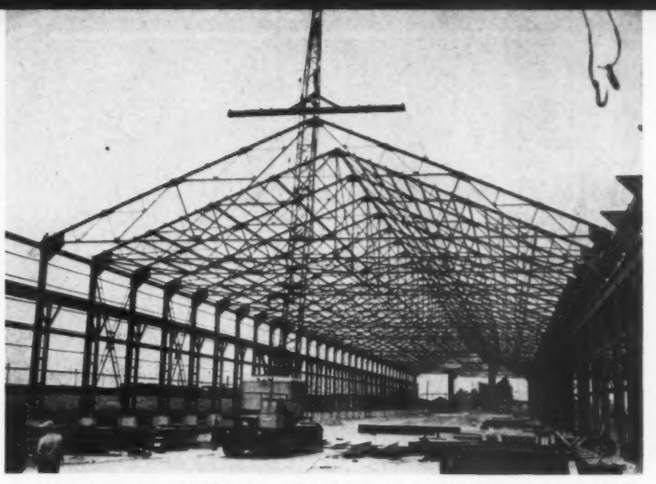
SANTA CLARA LOS ANGELES TORONTO MONTREAL VANCOUVER OTTAWA
Refinery Supply Company Tulsa • Houston



Washington, D. C., Bypass—To unwind part of the Washington, D. C., traffic snarl, construction has been started on a 4½-mile bypass which will carry cars and trucks around the nation's capital. J. O. & C. J. Stuart, Inc., Washington, D. C., are using three International TD-24 crawler-tractors with 16-yard scrapers to move 180,000 cubic yards of dirt.



New Steel Tube Mill—In Pueblo, Colo., Colorado Fuel & Iron Co., Denver, Colo., is building a tube mill covering an area of approximately 11 acres. Eichleay Corp., Pittsburgh, Pa., uses a 45-ton Lorain Moto-Crane, with a 90-foot boom and 18-foot jib to set these 125-foot trusses. The average lift was 9 tons, with 38 tons being the maximum load.

Osgood-General News

George N. Volz of 2816 S. E. 165th Ave., Portland, Oreg., has been named Division Sales Manager for the northwestern states and provinces of Canada by The Osgood Co. and The General Excavator Co., Marion, Ohio.

Osgood-General distributors in the territory are: General Machinery Co., Spokane, Wash.; Washington Machinery & Storage Co., Seattle, Wash.; Western Equipment Co., Eugene and Portland, Oreg.; Seitz Machinery Co., Billings and Great Falls, Mont.; Lund Machinery Co., Salt Lake City, Utah; and Columbia Equipment, Ltd., Vancouver, B. C., Canada.

Assisting Mr. Volz will be John Bernhardt, newly appointed Division Service Representative.

Frank Johnson, formerly Division Sales Manager, will concentrate his efforts in California, Nevada, and Arizona, with headquarters at the recently opened Osgood-General West Coast Branch, 326 Shaw Road, South San Francisco, Calif.

silaseal

Invisible Raincoat

STOPS

MOISTURE PENETRATION OF

MASONRY · STONE
BRICK · BLOCK

Silaseal stops moisture and protects natural appearance of stone and masonry. Dirt washes off after each rainfall. Use Silaseal for drier interiors, cleaner exteriors.

APPLY WITH BRUSH OR SPRAY

THE SURFACE PROTECTION CO.
16799 EUCLID AVE.
CLEVELAND 12, OHIO

Runways stay level and smooth *at Cleveland Municipal Airport*

Cleveland Municipal Airport, Cleveland, Ohio

FLEXCELL* JOINT FILLER KEEPS EXPANSION JOINTS TIGHT, SMOOTH, MAINTENANCE-FREE

On airport runways, highways and streets, bridges—wherever concrete meets concrete—Flexcell Bituminous Fibre Expansion Joint Filler assures neat, trouble-free joints that stay closed—practically never need maintenance!

The secret is in Flexcell Joint Filler's resilient cane fibre base. It's filled with millions of tiny air cells. These permit Flexcell to absorb pressure from expanding concrete without extruding, and spring back to keep the joint closed when the concrete contracts. Result—no bumps, bulges or gaping crevices—maintenance is virtually eliminated!

Low In Cost

Flexcell Joint Filler is easy to handle, easy to work with. Provides neat, finished joints without trimming. It is impregnated with asphalt to resist moisture—and protected by the patented Ferox® process against dry rot and termites. Withstands toughest service, severest weather conditions—saves on maintenance year after year. Yet with all this, it is *low in both initial and installed cost!*

Flexcell Joint Filler has long been specified by leading engineers, contractors and architects—as well as the United States Army, Navy and other Federal, State and Municipal agencies. It will pay you to discover the reasons for this preference . . . *before* you start your next job!

Mail coupon below for complete information on the advantages and economies of using Flexcell Joint Filler for pavements, runways, sidewalks, curbs, gutters, driveways, concrete floors. No cost or obligation!

Another **CELOTEX** *Product*
REG. U. S. PAT. OFF.

FLEXCELL
REG. U. S. PAT. OFF.

BITUMINOUS FIBRE EXPANSION JOINT FILLER

The Celotex Corporation, 120 S. LaSalle Street, Chicago 3, Illinois

*Flexcell is a Trademark identifying Bituminous Fibre Expansion Joint Filler marketed by The Celotex Corporation.

MAIL COUPON TODAY!

The Celotex Corporation, Dept. CE-63
120 S. LaSalle St., Chicago 3, Ill.

Without obligation, please send me complete data and prices on Flexcell Bituminous Fibre Expansion Joint Filler.

Name_____

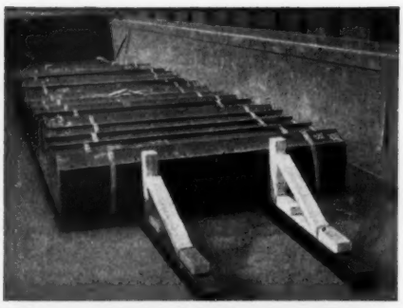
Address_____

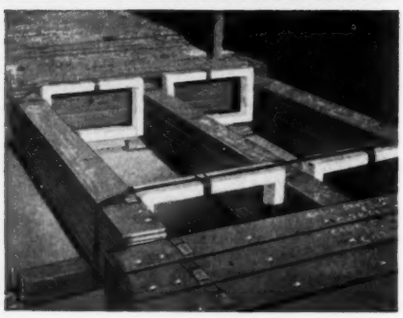
City_____ Zone_____ State_____

Scaffold Sheath—Sheathed in a web of sectional steel scaffolding, this 14-story downtown Chicago building gets a complete facelifting. Business goes on as usual while the A. L. Jackson Co. repairs cornices, paints windows, and replaces bad sections of terra cotta. The 572 Trouble Saver frames and 4,000-feet of Tubelox scaffolding gave workmen complete access to any part of the surface.

Sugar-Storage Silo—Three carloads of used rail provide the 120 tons of steel reinforcing in this 5-foot-thick concrete pad which will support a 120-foot-high sugar-storage silo in Cleveland, Ohio.

To compact this 5-foot slag fill and the 60-foot layer of sand on which the slab rests, 10,000 tons of gravel will be piled on top to create a load equivalent to the weight of the silo. The Austin Co., of Cleveland, designer and builder of the plant, used a fleet of twelve 4½-yard Jaeger transit-mix trucks to place the 772 cubic yards of concrete in only 7½ hours.





PACAL BLADES

for all your earthmoving equipment

Just as Pacal Blades resist wear, fit tighter . . . last longer, Pacal does a job for you. Whether you're just around the corner or 2,000 miles away, your Pacal Blades are expedited carefully. When you want blades, call on Pacal.

Use PACAL Heat Treated Plow Bolts . . . they increase the efficiency of PACAL Blades.

Write Department BJ-63

PAPER-CALMENSON & COMPANY

COUNTY ROAD F AND WALNUT ST., Adjoining Highway 36, ST. PAUL 8, MINN. • TELEPHONE: NEstor 9456

Desk-Size Machine Photocopies Records

A photocopy of an office record is made by machine in less than a minute without developing, washing, fixing or drying, according to Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y. The Transcopy Duplex makes finished positive copies, regardless of type or color, from originals up to 14½ inches wide in any length. No darkroom is needed.

The machine, which contains both a printer and a processor, takes up not much more space than dictating equipment. It plugs into any electrical outlet.

The original to be copied and a negative sheet are inserted face to face into the front exposure slot of the machine where they are pulled in by electrically driven rollers. When they emerge, the exposed negative paper only is inserted in the front slots of the developing section with a sheet of transcopy transfer paper. The positive copy is ready for immediate use in a few seconds.

For further information write to the company and request Booklet P344, or use the Request Card which is bound in at page 18. Circle No. 303.

DRILLING CONTRACTORS

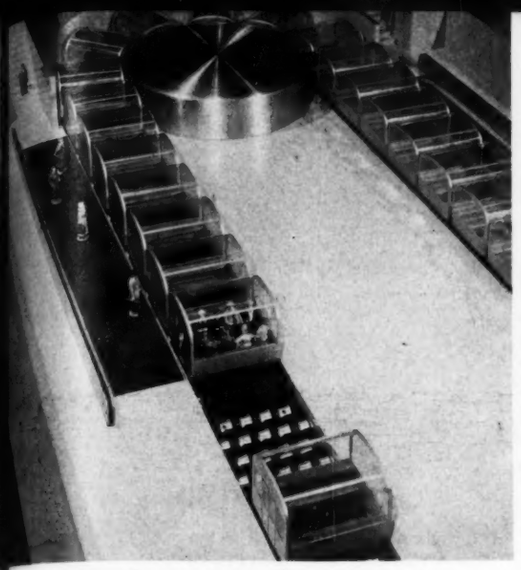
Diamond and Shot Core Borings, Dry Sample Borings, Grout Holes and Pressure Grouting, Foundation Testing for Bridges, Dams and all Heavy Structures

Manufacturers, also, of Diamond Core Drilling Machines and complete accessory equipment, including all types of Diamond Drilling Bits.

Write for Catalog No. 320

SPRAGUE & HENWOOD, INC.

Dept. C, Scranton 2, Pa.



Passenger Conveyor System—This 15-foot model is a scale replica of the passenger conveyor-belt system that has been proposed to replace the present Grand Central-Times Square subway shuttle in New York City. It would use moving loading and unloading platforms, closely spaced passenger cars riding on an endless track of rubber conveyor belts, and pneumatic-tired banks of powered wheels for speeding up and slowing down the cars.

The capacity of the system would be 32,000 persons per hour, as compared to a peak load of 23,000 in the present shuttle. Overall cost of the project is estimated at $3,800,000. Designers are Goodyear Tire & Rubber Co., Akron, Ohio, and Stephens-Adamson Mfg. Co., Aurora, Ill.

Dam Outlet—Dwarfed by the majesty of snow-capped mountains in California, construction on this outlet conduit for San Antonio Dam moves forward at the base of a steep hillside. The Traxcavator is loading selected backfill material to be used around the concrete barrel. *Ray Day Photo*

New Air-Drop Techniques

Developments in the field of airborne construction equipment and tests in air-drop techniques are being made at the Engineer Research & Development Laboratories, Fort Belvoir, Va. A 100-hp airborne tractor dozer, a 6-cubic-yard scraper, a 14,500-pound motor grader, tractor saws, towed scrapers, as well as crawler and rubber-tired tractors with bucket loaders, have been dropped without mishap. Other items to be drop-tested include air-compressors, cranes, rock crushers, and rollers.

Equipment destined for air drop plus its shock-absorbing modifications must remain within the maximum critical limitations, which have been established at 16,000 pounds and an 8 x 8-foot cross section. The allowable air-borne height for air drop has been reduced by approximately 18 inches to provide space for special shock-absorbing gear and equipment to facilitate evacuation from the airplane. Special lifting eyes suitable for parachute suspension points are added.

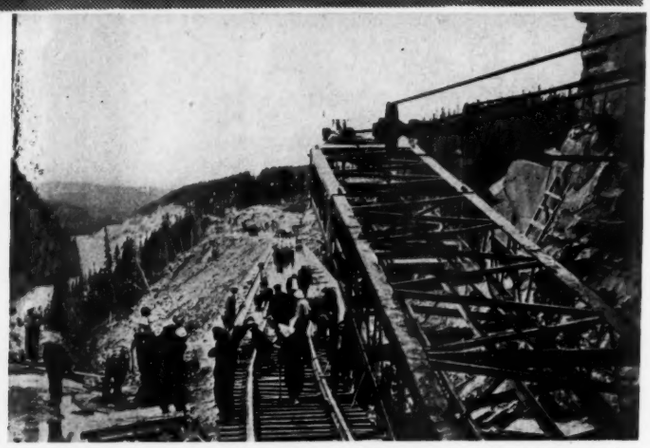
"ALL WEATHER"
DECALS
FOR LARGE & SMALL NEEDS
Save 75%
NO SALESMAN TO CALL
YOU SAVE IT ALL . . .
FOR PRICES AND SAMPLES WRITE TO
STORER DECAL CO.
1558 SO. MARKET WICHITA, KANSAS
10 DAY DELIVERY

THE BIG PUSH IS ON!

The big machines are on the move, swarming over the land and clearing the way for new roads, new buildings, new construction of every kind. It's a big job, but it's a job made much easier by Hyatt Roller Bearings. Hyatt bearings are built into construction equipment at vital load-carrying positions, to fight friction wherever shafts turn. And, Hyatts are the ideal bearings for the job because they're engineered for bigger loads, for longer life, and for *lowest maintenance costs!* Check the bearing specifications on equipment you buy.

"If it's built with Hyatts it's built to be the best!"

HYATT ROLLER BEARINGS
HYATT BEARINGS DIVISION • GENERAL MOTORS CORP. • HARRISON, N.J.



Labrador Ore—Here is some of the rough eastern Canadian terrain over which the Quebec, North Shore, and Labrador Railroad is being built to carry out rich iron ore from the recently opened fields in Labrador. The route will extend 357 miles from the St. Lawrence River to within 850 miles of the Arctic Circle. Ore shipments are expected to begin in 1954, with a production of 5,000,000 tons per year by 1955.

Turner Turnpike—Working on one of the final phases of Oklahoma's Turner Turnpike, this Pioneer Continuflo asphalt plant turns out bituminous shoulder material. Here, the process begins as a clamshell bucket stocks the feeder hopper. *Ray Day Photo*

Builds Cooling Tower

A gigantic cooling tower, expected to cool water from a temperature of 95 degrees to 80 degrees at the rate of 66,000 gpm is being erected by the Colorado Fuel & Iron Corp., at its Pueblo, Colo., plant.

The company is using redwood from California as the only material in the tower construction. The tower is being installed to cool all water needed in the operation of the power plant. Colorado Fuel & Iron engineers prefer redwood because it does not split or crack when subjected to alternate wetting and drying. Tons of redwood timbers, which arrived precut, notched, and match-numbered, are assembled in a jigsaw of interlaced lath without the use of nails and screws. This intricate pattern of criss-crossed lath is designed so that the tower will support not only its own weight but also the pressure of hurricanes, earthquakes, and winds of 100 mph.

The tower is 193 feet long, 63 feet wide, and 40 feet high. Water pumped in at the top will trickle through the lath, breaking into fine showers and, as it falls, will be subjected to air circulation from eight fans, 22 feet in diameter. As a fire precaution, the tower is covered with asbestos cement board.

Diesel Crawler Tractor

A diesel-powered crawler tractor with hydrualic torque converter is shown in a new booklet from Allis-Chalmers Mfg. Co., Tractor Division, Milwaukee 1, Wis. A large cutaway view shows details of the working mechanism of the Model HD-20.

In addition to the hydraulic torque converter, which is described in detail, the engine and the construction of the main frame are discussed. A spread is devoted to equipment made for this model by other manufacturers.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 291.

Shore Jobs and Profits **WITH THIS SHEETING**

On close-figured jobs you will find Armco Steel Sheeting a great help. It saves time, money and labor; helps cut job costs.

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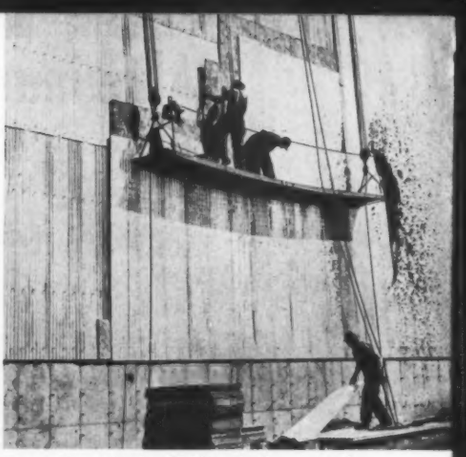
Clean Asphalt Plant—Clean as a whistle—and made to stay that way—this new asphalt plant will furnish 160 tons of hot-mix per hour to the Los Angeles area without emitting more than a thin trickle of pure steam. The 4,000-pound Standard plant, owned by Industrial Asphalt Co., is completely electrified and has a combination of dust and smog-control units.

Commercial Building Boom—Here is one of a number of fully air-conditioned office buildings rising in midtown Manhattan, N. Y. Harris Structural Steel Co., New York City, is fabricating and erecting the steel for this 23-story structure between 51st and 52nd Sts. on Madison Ave.



Fairless Steel Works—Finishing touches are made on one of the many buildings comprising the huge Fairless Steel Works on the Delaware River at Morrisville, Pa. Workmen place Fiberglas-insulated corrugated metal walls as a barrier against both cold and heat.

Engineering Appraisals

A revised, second edition has appeared of "Engineering Valuation and Depreciation," by Anson Marston, Robley Winfrey, and Jean C. Hempstead.

The text—rewritten and modernized—deals with concepts and procedures involved in appraisals of industrial, commercial, utility, and natural-resource properties for which it is desirable that engineers perform the appraisal. Techniques necessary in evaluation are discussed for various properties—physical, land, working, capital, and intangible—normally possessed by an industrial enterprise. Illustrations and figures on price and cost trends, brought up to date, accompany the text.

The book is essentially a college text, but useful as well as a reference work for practitioners. The publisher is McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36, N. Y., and the price is $8.00.

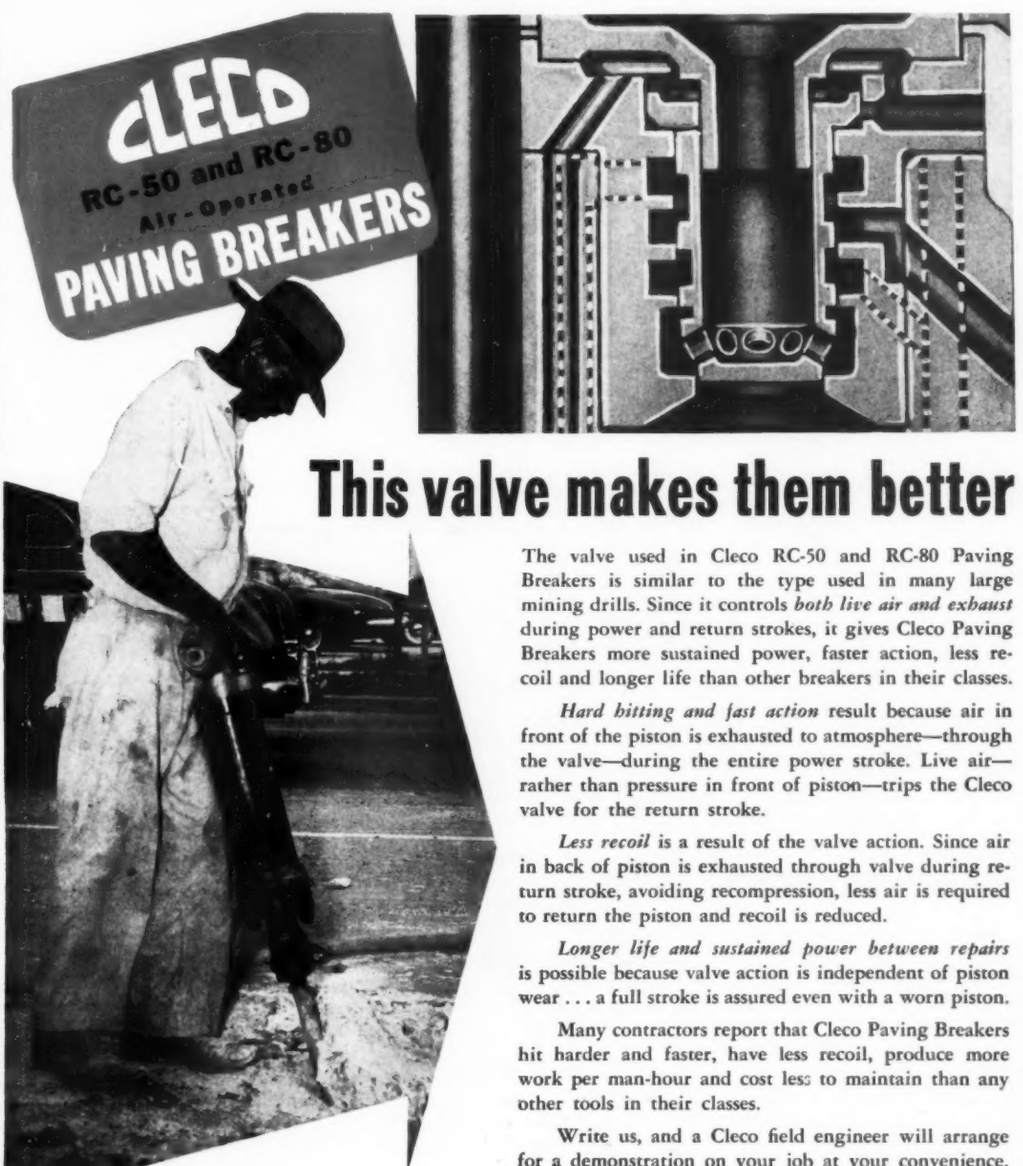
New Reinforcing Mesh

Improvements in its masonry-reinforcing mesh are announced by Adrian Peerless, Inc., 1442 E. Michigan St., Adrian, Mich. Wal-Lok mesh is now deformed and knurled; the No. 9-gage welded cross bars project beyond the 3/16-inch-diameter longitudinal rods. The projection of the cross bars increases anchorage in mortar. The mesh is made of 100,000 psi tensile strength cold drawn steel wire.

The manufacturer points out that deforming increases the gripping qualities of mesh over that of plain wire. The knurling, which consists of 150 indentations per foot, .002 inches in depth, improves bonding stress.

The mesh is manufactured in 12-foot lengths in sizes for wall thicknesses of 4 to 12 inches.

For further information write to the company, or use the Request Card at page 18. Circle No. 302.



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Aluminum and Glass Enclose Skyscraper

Steel Frame, Lightweight Concrete, and Prefabricated Skin Are Features of 26-Story Office Building

By RALPH MONSON, Field Editor

• PREFABRICATED panels of aluminum and glass will sheath the exterior of the new 26-story office building to be known as 99 Park Avenue, New York, N. Y. Selection of aluminum over the more conventional brick and stone follows the example of the Alcoa Building in Pittsburgh, Pa., and may set a precedent in commercial skyscraper construction. Tishman Realty & Construction Co., Inc., of New York, are the builders and owners of the structure. Excavation for basement and footings started in August, 1952, and initial occupancy is scheduled for November, 1953.

A scale model of the new all-aluminum-clad skyscraper is shown superimposed on a photo of the actual site at 99 Park Ave., N. Y., showing how the 26-story structure will look when it is completed.

Sheathing panels are approximately 21 feet in height and 4 feet wide, covering a 2-story elevation. The die-pressed panels of extruded aluminum have a 4-faceted geometrical design intended to pick up variations of light and shade. This will produce changing patterns on the building's facade during the course of the day.

The gray-toned aluminum alloy is said to possess weather-resisting and self-cleaning properties which should retain the new appearance for many years. This Alum-A-Lite finish also reduces the glare from the large expanse of metallic surfacing.

Heat-Absorbent Glass

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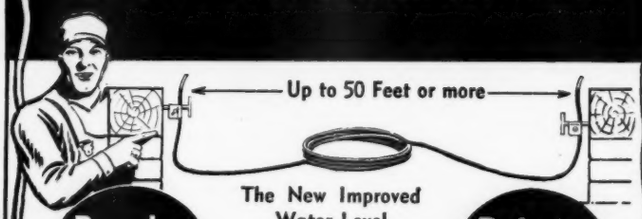

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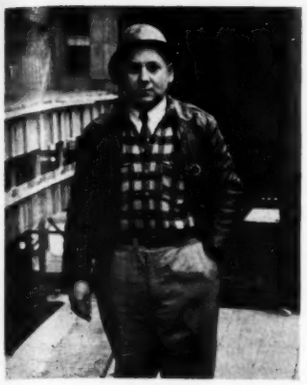


Sam Mark is General Superintendent for Tishman Realty & Construction Co. of New York, builder and owner of the new 99 Park Avenue Building. *C. & E. Photo*

prefabricated panels, consist of top and bottom-pivoted sash, glazed with heat-absorbent glass—similar to that used on the United Nations Secretariat and other recent buildings with large glass exposures. This glass reduces the cooling load on the air-conditioning system and cuts down on drafts within the building. Since the building will be entirely air-conditioned, the windows are kept locked in the closed position. Window cleaners and other authorized building personnel will use a key to open them when necessary.

With this type of exterior finish, it is unnecessary to use the usual hanging scaffolds to support workmen on the outside of the building. The entire installation is done from the inside. The rapid enclosure of the building accomplished with this construction provides quick protection from the weather for workmen engaged in the interior finishing operations. The entire exterior is expected to be enclosed in about one month.

Sheathing panels are bolted to angle supports which in turn are bolted to channel-shaped clips welded to the steel frame. The alignment and welding of these clips was a delicate operation, requiring the services of a transitman and his instrument to keep the alignment within the required tolerance.

The 1,200 wall panels were completely fabricated on assembly-line basis at the Garden City, N. Y., plant of the General Bronze Corp., and transported by truck to the site. The aluminum walls are backed up with insulated lightweight block construction.

Plan is L-Shaped

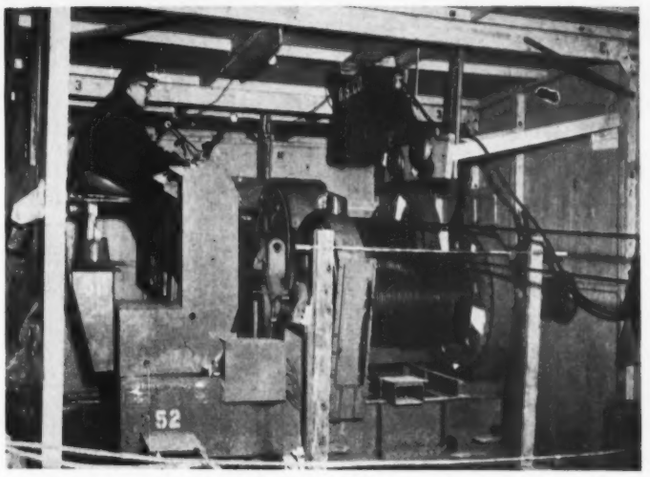
The building faces Park Avenue and occupies the east block front between 39th and 40th Streets. Its ground floor dimensions are 197 feet on Park Avenue, 155 feet on 39th Street, and 105 feet on 40th Street. The area of the lower floors is approximately 22,500 square feet. This area reduces with several setbacks to 6,550 square feet in the tower. Total rentable office space is estimated to be 403,500 square feet.

As the dimensions indicate, the building is L-shaped at the ground level. The wing on 39th Street which forms the L is 11 stories high. From the 11th floor to the top, the building is rectangular. Setbacks occur on the 15th, 17th, 21st, and 23rd floors. The top 30 feet of the building is a tower containing elevator equipment, cooling tower for the air-conditioning system, and other mechanical equipment.

A wide entrance is located at the center of the Park Avenue side. Entrance doors, set back from the street, lead to a central foyer extending to the elevators at the rear of the building.

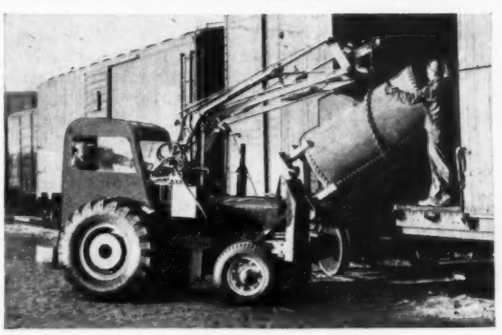
Maximum depth below the street occurs in the boiler room, the floor of which is 36 feet below Park Avenue curb grade. A garage entering from the 39th Street side has spaces for approximately 65 automobiles on three levels. Entrance is on the middle level, with an elevator to raise and lower cars to the other levels. A power-operated turntable immediately in front of the elevator on the upper and lower levels will turn cars in any direction. This eliminates the necessity of turning maneuvers in getting from elevator to parking space or return. The

(Continued on next page)



This double-drum American hoist driven by a Waukesha engine operates one of the guy-derricks erecting steel above. The operator receives signals through bells and lights located above the winch drums. *C. & E. Photo*

Why Shoveloaders® do more jobs than any other front end loader



Another Shoveloader® *Performance Report*

A midwestern construction company* handles major road construction jobs all over the United States. They own four Lull Shoveloaders and place one on every job possible. They are used for picking up and loading broken concrete, cleaning up around bins in asphalt plant, etc. They are used, with crane hook, for handling construction of asphalt plant, hoisting auxiliary engines, setting up hoppers, and loading feeders on to trucks when sending material out to jobs. They pull tampers, power booms and pneumatic rollers, and do clean up around trucking company yards. They are also sent out on rental for snow removal jobs. These Shoveloaders have required no attention other than routine maintenance.

This experience of this construction company shows why Shoveloaders do more jobs than any other front end loader. It is routine to see Shoveloaders everywhere being used for a wide variety of jobs and for types of work which ordinary front end loaders just can't handle.

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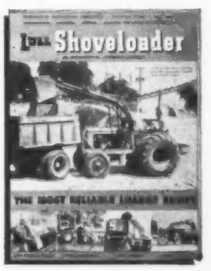
Shoveloaders mount exclusively on dependable Case, Minneapolis-Moline, Oliver and Sheppard diesel industrial type tractors. Contact these distributors for complete information and let them demonstrate what Shoveloader can do for you.

The easily added snow and coal bucket, fork, bulldozer, crane and broom tools keep the Shoveloader busy on dozens of jobs all year around.

**Name on request.*



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Aluminum and Glass Enclose Skyscraper

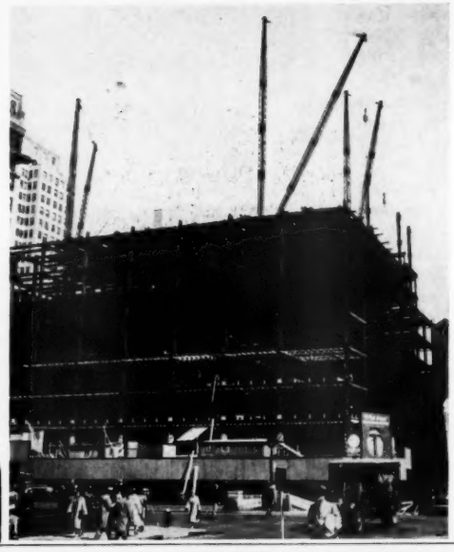
(Continued from preceding page)

garage is intended exclusively for use by tenants of the building. Sub-basement record-storage facilities are also available to building occupants on a rental basis.

Footings in Rock

The steel framework of the building rests on concrete footings averaging 4 feet square and varying from 2 to 8 or 9 feet in depth. The entire area is underlaid with a solid rock formation which provides excellent footing conditions.

A portion of the site has for many years been used for tennis courts. The balance was occupied by an old building used for many years as a soldiers and sailors club by the USO. Following demolition of the building and clearing of the site, excavation was begun in August, 1952, by Howard Collins Construction Co., New York, N. Y.



Three guy-derricks are working from the ninth-floor level setting steel for the tenth and eleventh floors of this 26-story office building. Forms are under construction on the fifth floor, while on the fourth, welders are attaching braces to which the aluminum exterior will be fastened. *C. & E. Photo*

Collins removed approximately 25,000 cubic yards of earth and 9,000 cubic yards of rock in excavations which extended as much as 41 feet below Park Avenue. The earth excavation consisted largely of a soil known locally as Murray Hill hardpan and consisting of a very dense mixture of earth, rock, and clay. This material stood on a very steep slope thereby requiring a minimum of sheathing and shoring.

On the Park Avenue side, the excavation extended only to the building line. Here old rubble-stone sidewalk-vault walls from previous buildings were underpinned to rock—a distance varying from 3 to 7 feet. These old stone walls then held up the street and no sheathing or shoring was necessary on this side. On the 39th Street and 40th Street sides, the excavation extended out to the curb line forming a vault space under the sidewalk about 12 feet in depth.

Here Collins started his excavation at the curb line, letting the hardpan stand at the steepest slope deemed safe. This permitted him to get down at the building line to a depth of approximately 25 feet using very little sheathing. He then constructed the building wall which extends up only to the base of the sidewalk vaults, building 20-foot sections at a time. Using this wall to brace his shoring, he was able to complete the excavation of the sidewalk vaults without the use of long or heavy shores.

Foundations of adjacent buildings to the east did not extend down to rock, and the contractor was required to underpin these footings to depths as great as 15 feet. This was accomplished by excavating and pouring short alternate sections.

Approximately 1,500 cubic yards of 3,500-psi controlled-mix concrete were poured in the footings and foundation walls, and approximately 80 tons of reinforcing steel was used. Ready-mixed concrete was supplied by the Transit Mix Concrete Corp. of New York City. Concrete for exterior walls was delivered to the job in the dry condition in the ready-mix trucks. Water was added at the site together with a measured quantity of Anti-Hydro integral waterproofing compound as an aid in producing waterproof exterior walls.

Equipment used by Collins on the work included a 2-yard Bucyrus-Erie shovel and a ¾-yard Lima. These shovels loaded the material into a fleet of hired trucks which hauled it to a Port Authority stockpile near LaGuardia Field. A battery of Ingersoll-Rand and Worthington wagon drills provided holes for blasting the rock. An Ingersoll-Rand and three Chicago Pneumatic compressors supplied air.

Blasting was done with Du Pont 40 per cent dynamite, wire-rope mats being used to confine flying rocks. An International tractor and dozer and a Marlow 3-inch Mud Hog pump were used when they were necessary.

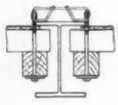
Use Three Guy-Derricks

Erection of the structural steel framework began in March and

SUPERIOR ACCESSORIES ON THE BEAM

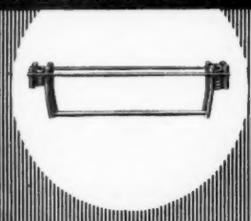
Designed to meet field conditions on BRIDGE SUPERSTRUCTURES, these three types of Hangers provide efficient means for hanging forms from steel beams and girders, not fireproofed.

STANDARD COIL HANGER FRAME

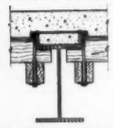


When hanging forms where specifications do not permit any hanger wire to be exposed after stripping, use Superior *Standard* Hanger Frames. Detail at left shows their use with double ledgers, ½" coil bolts, and flat washers. Total safe load on both bolts is 4,500 lbs., or 2,250 lbs. per bolt.

SPECIAL COIL HANGER FRAME



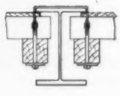
AT LOW HAUNCH



AT HIGH HAUNCH

The design of certain bridge superstructures allows for the permanent deflection of the beams or girders due to the pre-calculated dead load. This deflection is compensated by a concrete haunch on the upper flange, which varies in depth. Superior *Special* Coil Hanger Frames were developed to efficiently meet this field condition, at the same time avoiding any exposed hanger wire. The extent to which the ½" Coil Bolts are threaded into the coils allows for these varying haunch depths from maximum to zero. (See detail at left.) Total safe load per frame is 10,000 lbs., or 5,000 lbs. per ½" bolt.

COIL BEAM SADDLE



Superior Coil Beam Saddles are used, as shown at left, where hanger wires may be cut after stripping the forms. The Coil Bolts allow for any variation in lumber and flange thickness and tightening the bolts pulls the forms tightly against the flanges. Forms are easily stripped. Safe load is 6,000 lbs. per saddle, or 3,000 lbs. for each ½" Coil Bolt. Coil Beam Saddles are also furnished for ¾" and 1" bolts.

NOTE: WORKING PARTS (Bolts and Washers) are returnable. Layouts and estimates for Superior Hangers are available without cost or obligation.

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progressed at the rate of one 2-floor tier every three days, weather permitting. Bethlehem Steel Co. furnished and erected the steel. On the lower levels they used three guy-derricks to handle the steel, cutting down to two in mid-April when the 11-floor wing on 39th Street was completed. Each of these derricks was powered by a 2-drum American hoist driven by a Waukesha gasoline engine. The hoists were located on the ground floor with the cables threaded up through the framework to the derricks above. Communication between the erecting gang and the hoist operator was maintained through a bell and light system.

Production and fabrication of the more than 4,000 tons of steel took place at the Bethlehem, Pa., plant. From there it was shipped by rail to Jersey City, N. J., then by lighter to the 21st Street-East River dock, and finally by Bigley Bros. truck-trailers to the job. Three trucks were required to supply each derrick and its crew. Largest of the 14-inch columns in the structure weighed 398 pounds per foot while the lightest weighed only 43.

Six riveting crews of four men each kept pace with the erection. Air for them was supplied by a Worthington 315-foot compressor located on the street. From the compressor, air passed to a reserve tank and then through a system of hoses to the riveters.

Lightweight Concrete

Concreting followed closely behind the steel erection. Concrete for fireproofing of the steel as well as for the floor arches is Gritcrete lightweight concrete. The mix contains ⅜-inch crushed-stone grits, sand, and cement to which was added approximately 1 pound per 6-sack batch of Gritcrete Compound No. 1, an aluminum powder which causes an expansion of approximately 20 per cent in the volume of the concrete after placing. This volumetric increase gives the light weight without the use of lightweight aggregates. As contrasted with cinder concrete, this mix is not corrosive to the steel, and painting of the steel framework was unnecessary. The finished Gritcrete when dried out weighs about 108 pounds per cubic foot.

Aggregates and water for the 6-bag mix were measured volumetrically. Sack cement was used, and the Gritcrete admixture was added to the charging hopper manually from bags containing the exact amount recommended for that size batch. A very wet mixture was used in the column and beam forms, with the mixture being dried up to about 6-inch slump for the arch slabs.

Floors are finished with a 1-inch topping of sand-cement mortar over 4 inches of concrete. The mortar topping is placed approximately one day after the pouring of the slab and is struck off and hand floated. The type of finished floor to be placed over the mortar topping will depend upon the use to which the particular area is to be put.

Tishman produced the concrete for the building on the site. The mixing plant was set up about midway between the north and south side of the building and near the east side. Aggregates and cement were received by trucks which backed in on a platform from the Park Avenue side. Aggregates were dumped directly into two hoppers at ground-floor level. At basement level the materials flowed by gravity from hand-operated cutoff gates into the proportioning hopper above the mixer. Cement was unloaded at ground level. Sacks were opened and dumped into an enclosed chute leading to the proportioning hopper on the floor below.

The proportioning hopper discharged by gravity directly into a Construction Machinery Co. 1-yard mixer located in the subbasement; it was powered by a 25-hp electric motor. From the mixer, concrete flowed into a V-shaped skip of 36-cubic-foot capacity which traveled on guide rails attached to the steel building frame. The skip was raised to the proper floor by a 125-hp electric hoist where it was tilted by the guide rails, discharging the concrete into a 60-cubic-foot hopper. The hopper bottom slopes toward the two discharge openings where radial cutoff gates permit the loading of two buggies at a time. Steel-wheeled Jackson buggies transported the mix from hopper to point of placement. Daily pours averaged around 190 cubic yards for every 7-hour shift.

Test specimens—6-inch cubes—were taken at the rate of at least one for each 10,000 square feet of floor poured. These cubes are cured and tested for compressive strength at 28 days. Aggregates were supplied by New York Cinders Delivery Co. and

(Concluded on next page)

CHOOSE a CHAUSSE Model CJD-400 for your SMALL jobs

This new addition to the CHAUSSE line of Spreadwell Distributors is specially designed for ease in manipulating all controls. Note the operator's platform at left rear, where all controls are within easy reach. Like all CHAUSSE spreaders, this new model is the last word in rugged, dependable, efficient performance.

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The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

Notekeeper: W. & L. E. Gurley, America's Oldest Engineering Instrument Maker

Second Annual Report to Surveyors

It has been a year now since our first report to you on the progress of "The Surveyor's Notebook."

In the past twelve months these "unusual surveying problems and their solutions" have helped an ever-growing number of engineers and surveyors to use their instruments with greater pleasure and profit. And the page has developed into a professional forum for exchange of useful information—and, sometimes, a discussion of controversial techniques.

Jack Goggin, Marathon, Fla.

Thousands of copies of the collected articles from the first year's series have gone out to surveyors who asked for them. In fact, requests from field men were so numerous that a third printing is nearly exhausted.

And now we are pleased to announce that the second year's stories and tips from "The Surveyor's Notebook" have been gathered together and reprinted in permanent form.

Tractor and Level Whip Mud Flats

The problems and "tricks of the trade" in Series 2 are new. George Gabus of New York City's Board of Water Supply, for instance, tells you his method of eliminating errors in precise alignment. A Cleburne, Texas, surveyor relates what can be done about weather conditions hampering every man in the field.

On one page, Chicago's George Salter shows how to subdivide 50,000 acres into nearly 200 lots in accordance with the rights of 600 people. On another, Maryland's Wesson Cook gives his method for bringing in stations in the muck of the Red River Valley.

Surveying the Antarctic

The Virginian Railway Company's Henry Stanley will cause a great deal of comment, we are sure, with his use of the gradienter in rough terrain; and G. W. Herzog of Shell Oil Company may surprise you with his use of a level on a tractor for whipping mud flats.

"A Bit More Mauka, a Few Feet Makai" describes how Prof. Russell Brinker of VPI solved unique problems in tracing old land deeds in Hawaii. And Comdr. Richard Black recounts his adventures while surveying the Antarctic.

John Goggin's method of determining in the field, without calculation, whether or not a survey closes will solve many a headache, as will S. E. Huey's page on getting more out of your compass. And a New Hampshire forester and land surveyor, Gerald Hyde, even tells how a surveyor can add new business with alignment jobs *inside* industrial plants.

We will be glad to send you a free copy of this new "Surveyor's Notebook." Just write for Series 2.

When you write for your bound copy of "The Surveyor's Notebook"—Series 2, ask also for the new Bulletin 50. It gives full details on Gurley instruments.

New Series

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(Continued from preceding page)

Transit Mix Concrete Corp. Penn-Dixie cement was used.

Forms Are Made of Wood

Forms were constructed almost entirely of 1-inch lumber, surfaced on one side only. With few exceptions, the formwork was hung from the structural steel and no shoring was required. In the typical form, 1 x 4 stringers, spaced at about 18-inch centers, were suspended from the steel with wires. Beam bottoms rested on these supports and the beam sides and slab forms were built up from them, all being of 1-inch lumber.

Column forms were made of vertical boards held in place with adjustable steel clamps. Form lumber was re-used a maximum of five or six times. Floor arches are reinforced with welded steel mesh.

Concrete-mixing and hoisting equipment was all supplied by the United Hoisting Co. of Englewood, N. J., on a rental basis. Skip and hoppers are of United's own design and manufacture. When pouring of concrete is completed, the concrete skip will be replaced with a platform, and the hoisting equipment will be used to transport building materials to upper floors.

A Chesbro-Whitman material hoisting tower is located on the 39th Street side of the project. The single-platform hoist has a capacity of three wheelbarrows and is used to hoist building materials to all floors of the structure. Power is supplied to the hoist by a 125-hp electric motor.

Air Conditioning

Outstanding feature of the mechanical equipment of this building is the air-conditioning system. Fin-coil units located under the windows will provide both heating and cooling. In cold weather these coils carry warm water for heating. Chilled water circulates through the same coils in warm weather, cooling the air which passes over the coils. Mechanical equipment will provide the 1,350 tons of refrigeration required to maintain comfortable conditions in warm weather.

Fresh air is circulated through the building by an independent system. Provision has been made in the subbasement for installation of a heating boiler if desired. High-speed Westinghouse elevators with the latest type of electronic signal control will speed the vertical movement of people within the building.

Personnel

Architect for the building is Emery Roth & Sons of New York City. Consulting engineer on the mechanical features is W. R. Cosentini & Associates, and Victor Mayper & Associates is the structural consultant. General Superintendent for the Tishman Realty & Construction Co., Inc., is Sam Mark. John Stuart was Foreman for Bethlehem Steel Co.

A total of 17,671 signs appear along the Delaware highway system —more than 3,900 miles of all types of highway. These signs, placed by the State Highway Department, carry information on traffic, speed limits, route numbers, warnings, and figures on mileage to various destinations.

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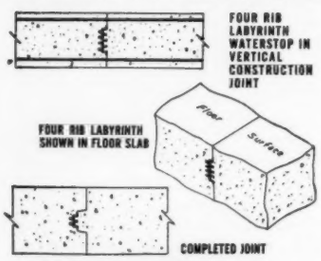

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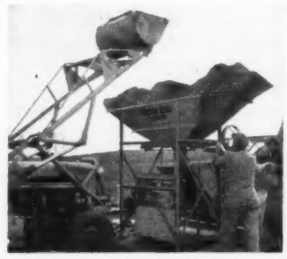
Models B—BW Twin Bin are used with 1-2-3-4 bag mixers and larger pours.

Models AW — BW are permanently mounted upon a rubber tired trailer. You may obtain the trailer if you want to convert your Models A—B to mobile units.



Twin Bin Model A is shown being loaded. The low height allows the use of small low-priced loaders or clams. The operator is moving the positive shut-off valve to weigh accurately the first time.

Twin Bin Model BW is shown in the forward dumping position. The operator releases the weighed aggregate at the right spot in the mixer skip. The Scale Bin moves on greased packed jam protected bearings. Its movement allows it to be used with some bituminous plants. Note the screw-jack leveler below left.

Twin Bin Model BW is shown working and being loaded on its permanent trailer mounting. It is easy to set up work, operate and pull. The tongue is in the fold-up position. This model stores and weighs larger batches. Note the Stock Bin with its divided wall and the beams and working parts of the built-in 1000 lb. scales. Three men are doing this job.

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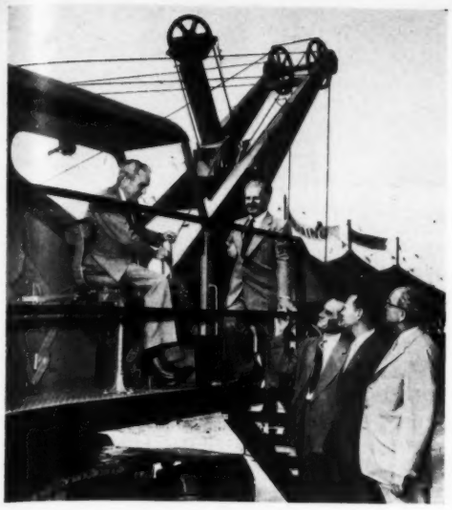

At Koehring plant opening (left to right): J. R. Steelman, President; E. A. Brugger, Vice President; N. J. Decker, Local Plant Manager; W. S. Cambron, Plant Secretary-Treasurer; and Peter G. Graser, Secretary-Treasurer of Koehring companies.

Koehring Opens Plant

A six-day open-house celebration opened Koehring Southern Co.'s new plant at Chattanooga, Tenn. Koehring Southern is a subsidiary of Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis., manufacturer of Dumptors, Cruiser Cranes, Twinbatch pavers, Mud Jacks, and other construction equipment. New models of Koehring excavators will be produced at this southern plant.

Hosts at the opening were more than 30 officers, directors, and members of the sales organization from the parent company and other subsidiary companies. The occasion was highlighted by a special equipment exhibit at the plant, consisting of $220,000 worth of Koehring and subsidiary products.

N. J. Decker is Chattanooga Plant Manager; W. S. Cambron is Secretary-Treasurer.

A view of Koehring's Chattanooga plant and some of the equipment on exhibit for its opening.

Asphalt Crack Filler

A filler for cracks in concrete or other rigid materials is described in literature from Maintenance Products, Inc., 807 W. 3rd Ave., Columbus 12, Ohio. Gemaco crack filler is asphalt in the form of a cold liquid emulsion. It congeals in the crack to seal it against dust, air, or water.

The manufacturer states that the filler does not congeal prematurely at low temperatures or upon contact with cold surfaces.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 292.

Double-Roll Crusher Line

A new catalog on double-roll crushers has been published by Smith Engineering Works, 532 E. Capitol, Milwaukee 12, Wis. Made in three sizes, 24 x 16 inches; 30 x 18 inches; and 40 x 22 inches. Telsmith roll crushers reduce large capacities of intermediate or fine aggregate at low reduction ratios. For secondary crushing at higher reduction ratios, the company offers the Gyrasphere and Intercone crushers, covered by separate catalogs.

To obtain this literature write to the company for Catalog No. 282, or use the Request Card at page 18. Circle No. 223.

Approach to Drafting

"Simplified Drafting Practice" by William L. Healy and Arthur H. Bau, is a new book marking the first major change in industrial drafting practices in years. Replacing old time-consuming concepts of drafting, it teaches new effective methods such as simplification of delineation, elimination of non-essentials, and extensive use of freehand drawing. The authors discuss savings in money, time, and materials. Simplicity in drafting will give the draftsman more hours for creative thinking and application.

The book is published by John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., and sells for $5.00.

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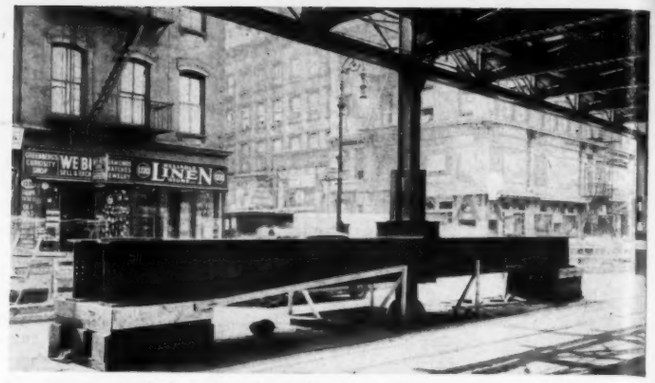
Building Subways For New York City

System Includes Open-Cut Construction, Land Tunneling, And 13 Subaqueous Tubes Under Rivers

By JAMES H. GRIFFIN, Chief Engineer
Board of Transportation, City of New York

(Part Two of a Two-Part Article from a Paper Given by Mr. Griffin at a Recent Metropolitan Section Meeting of the American Society of Civil Engineers)



In constructing the Sixth Avenue subway, the existing "El" column was supported on this runner beam at 48th Street. The "El" was removed after the subway began operating.

Thus far, we have dealt largely with matters of design and inspection. We now come to a discussion of construction in the field, limiting this to a mention of some of the salient features of subway and tunnel construction under city streets and under adjacent rivers.

As is well known, geological conditions encountered in the boroughs of our city are quite varied. We also find wet and dry conditions. In the northern part of Manhattan Island and in The Bronx, rock is found at or near the surface. The character of this rock varies from the blocky and relatively soft Manhattan schist to the harder Fordham gneiss found in The Bronx. South of 14th Street, in Manhattan, one encounters at subway depth mainly a mixture of sands and clays in various proportions, and occasionally bedrock ledges. In some locations in the various boroughs we find peat beds several feet thick; in others quicksand; and in still others an impervious, soft, waterlogged clay known unfavorably to subway builders as "bull's liver". Brooklyn and Queens, except for a small area in Queens near the East River, are soft-ground boroughs. Brooklyn is the site of a glacial terminal moraine which extends, backbone fashion, along Long Island. Thus, there are numerous boulders to be found in that area. Furthermore, Long Island is dotted with clay lenses surrounded by sand strata. Whenever clay lenses are punctured in the course of excavation for a subway, peculiar things may happen. For instance, while excavating for a subway in the East New York section of Brooklyn, a property owner came to see the contractor's superintendent one day and said he had a very serious complaint to make. The superintendent, who was accustomed to listening to property owner's complaints, said: "Well, let's have it." Whereupon the property owner, with a chuckle, reported that since the excavation had been made in front of his house, water had disappeared from his cellar, and it was now bone dry, whereas he had always been bothered by a wet cellar before. The excavation had punctured one of the

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clay lenses, and permitted the trapped water to drain off.

Due to geological conditions and the necessity of maintaining both street traffic and subsurface utilities, subways are built in trenches under completely or partially decked streets, or in rock and earth tunnels under land and under rivers, depending upon the depth below the surface. Where ground water is encountered, in soft ground, it is lowered and maintained at a level below subgrade by pumping either from temporary sumps or from deep-driven wells. Occasionally in shallow cuts, water is lowered by the wellpoint system.

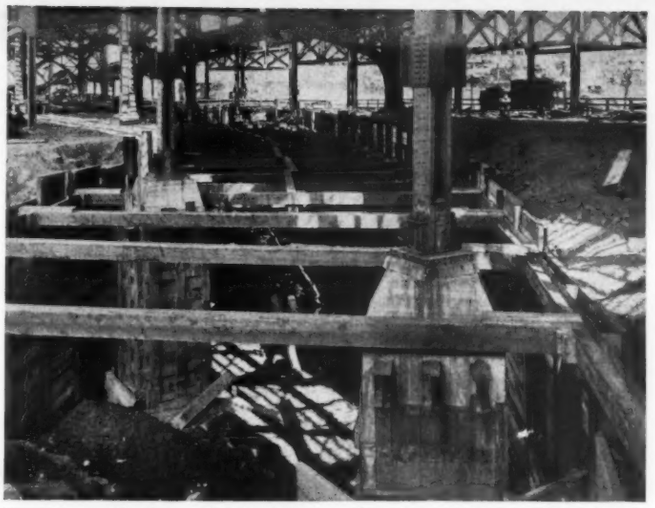
Water Diffusion

In 1933, Section 521-A of the State Conservation Law was enacted to protect the water supply of Long Island. This section placed the control of pumping in large quantities under the jurisdiction of a Water Power and Control Commission which requires all water pumped from the ground in excess of 100,000 gallons a day to be returned to the ground. The diffusion of large quantities of water may not always be successful. In 1939, the Board was constructing a 4-track extension to the IND Division in Pitkin Avenue, Brooklyn. On one of the contract sections (Route 110, Section 9), ground water was encountered for about nine blocks at the easterly end of the section, varying in depth up to about 10 feet. The cut was in fine to medium sand, unmixed with clay, and required twelve 12-inch deep-well turbine pumps operating continuously to lower and maintain the desired groundwater level over a period of several months. The total output of the twelve pumps operating at full capacity was 6,000 gpm (8,000,000 gallons per day). An attempt was made to diffuse this quantity of water back into the ground by constructing 14 diffusion wells, each equipped with 30-foot screens, 10½ inches in diameter. This attempt was about 70 per cent successful when all 12 pumps were in operation.

As a result of the experience gained on this section of subway, as well as on the adjacent section, the field engineers in charge recorded their recommendations for consideration in connection with the design and operation of any future diffusion systems. These recommendations are given here, for what they may be worth.

1. Construct one or more pilot diffusers with nearby observation wells to ascertain capacity of diffusers and the rise in adjacent water levels, thus determining the circle of influence. Be guided by the data so obtained in spacing diffusers in reference to each other and to the producing wells; also, in reference to building cellars in the vicinity.
2. Provide overflow pipes for each diffuser leading toward the ground surface.
3. Provide means of measuring rate of flow of water into each diffuser.
4. Use gravel-packed diffusers with large screen slots.
5. In built-up areas, protect diffusers from vandalism by surrounding them with enclosures that can be put under lock and key.

Of course, the sequence of trench construction must be carried out in such a manner as to minimize interference with street traffic, principally fire apparatus. Except for short periods when decking is being installed or removed and street surface utilities restored, street intersections must be kept open at all times to their full width.



Some of the underpinning and timber bracing in place at Queens Plaza, Long Island City. An elevated rapid transit line is above the subway at this point.

Land Tunnels

Land tunnels are built where it becomes impracticable or uneconomical to follow the general contour of the street surface. Most land tunnels are in ledge rock such as: IRT Division under Broadway in the Washington Heights section of Manhattan; the Queensboro subway under 42nd Street; the express level of the Lexington Avenue line; part of the IND Division in Sixth Avenue (renamed Avenue of the Americas). In Brooklyn, tunnels were built in

(Continued on next page)

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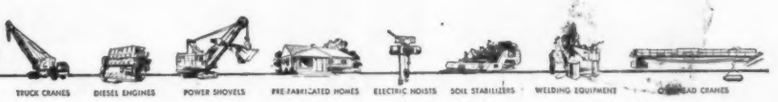


Building Subways For New York City

(Continued from preceding page)

earth for the BMT Brighton line through the terminal moraine under Flatbush Avenue and for the IND south of Prospect Park, the latter being a concrete-block-lined tunnel built by the use of a shield in free air.

A feature of rock tunneling is the control of rock dust in drilling operations, to minimize the effect of rock dust in producing the disease known as silicosis. Dust control is accomplished by the use of water-liner drills or by special ventilation systems directed to the heading, or by both methods.

Blasting charges are limited by proximity of buildings and important underground structures; also limitations are sometimes placed on blasting at night by the proximity of hotels, hospitals, and residential areas. Specifications require that contractor's working machinery shall be designed to operate with a minimum of noise. In Sixth Avenue, Manhattan, shaft-head works were soundproofed to minimize the noise of rock handling at the surface.

"Soldier beam" bracing system in place. The vertical steel H-beams are spaced close together along the sides of the cut, and support the horizontal timber lagging.

Subaqueous Tunnels

Of the 13 subaqueous tunnel crossings carrying rapid transit, all but two were shield-driven. The first Harlem River tunnel—a twin cast-iron tube of the Lenox Avenue subway—was constructed in a closed under-water caisson. Ten years later, the Lexington Avenue 4-tube steel-plate tunnel under the Harlem River was constructed by the sunken-tube method.

Although the process of constructing shield-driven tunnels has not materially changed over the years and is, therefore, well known to tunnel engineers, a brief statement of the methods of construction of the Board's shield tunnels may have its place in this discussion.

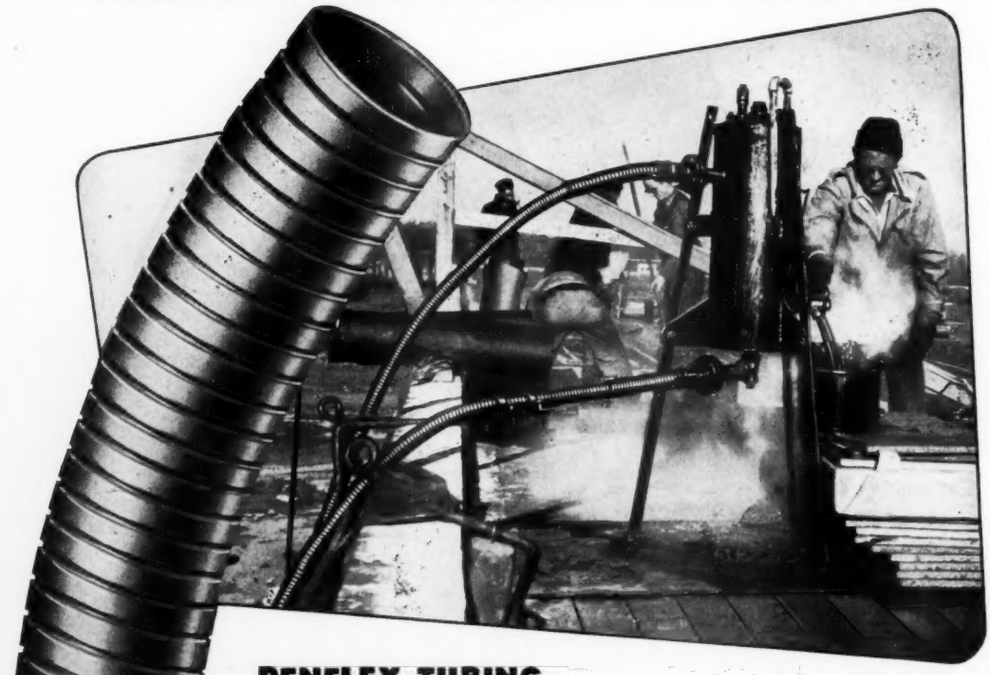
Shield-driven subaqueous tunnels are composed of cast-iron rings and lined with concrete. These tunnels are constructed behind a hollow-steel cylinder or shield, of slightly larger diameter than the tunnel, which is advanced by hydraulic jacks reacting against the cast-iron rings. The shield is usually assembled at the bottom of the river shaft. When two shields are used they are started out of the shaft from opposite river banks in free air and progress toward the center of the river. A series of compression chambers or locks are installed (one man lock and two material locks) after the shield has advanced a short distance from the shaft, and compressed air is applied to the heading except when the tunnel is passing through sound rock.

Much of the soft material of the riverbed is pushed aside as the shield advances. The balance is taken in through openings in the shield and passed out of the tunnel through the material locks.

The metal tunnel-lining rings are erected by hydraulically operated erector arms attached to the shield. There is an annular space between the outside of the rings and the tail of the shield, through which grout, or pea gravel and grout, are blown, to fill the voids outside the tunnel lining that are created by the difference in diameters of the tunnel and shield. Filling of these voids minimizes loss of ground and movement of the earth around the tunnel.

A feature of subaqueous-tunnel construction is the use of compressed air. This must be provided in ample quantity, both for normal use and for emergencies. Unless there were sufficient air pressure, the tunnel would be flooded. On the other hand, air under pressure in a tunnel tends to escape to the surface through the riverbed. When large quantities of air escape, a serious situation develops. It is called a "blow". Tunnel workmen, aptly called "sand hogs", have been blown from a tunnel heading up through the riverbed to the surface of the river. This happened to one of the sand hogs during the construction of the IRT Battery tunnel of the first subway. Fortunately, he was fished

SOLVED...A HOT PROBLEM...TAR ALWAYS ON TAP AT 400°F.



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PENFLEX
HEART OF INDUSTRY'S LIFE LINES

out of the river alive, but needless to say, somewhat the worse for wear. It happened again during the construction of the IRT-Whitehall Street tunnel. This time, three men were blown from the tunnel heading up through 30 feet of muck to the surface. One of the three survived.

To overcome the tendency of the air to escape in large quantities, and thus to minimize the possibility of flooding the tunnel, where lack of cover or of sufficient resistance of the rivedbed warrants it, a temporary clay blanket is deposited over the tunnel in advance.

Those who work in compressed air must be physically sound and rugged, as they are required to undergo compression and decompression on each shift. Their hours of labor per shift are limited by law, and are decreased as the pressure increases up to 50 psi above atmosphere, the legal limit of pressure in this state. Decompression between the tunnel heading and atmosphere takes place in the man lock previously referred to. The time required to decompress depends, of course, upon the pressure in the working chamber and is likewise controlled by law. This process should never be hurried as the penalty may be a severe case of caisson disease called "bends" which sometimes results from too rapid decompression. Caisson disease can be very painful and may result in death.

Suggestions of All Kinds

On the lighter side of this discussion, there is always a considerable volume of correspondence with people who make suggestions, meritorious and otherwise, for improvements in the subway. Such suggestions are usually addressed to the Mayor and are forwarded to the Board of Transportation for such action "as the facts may warrant". The Board tries to answer them all except, of course, anonymous ones. Some would seem to fall into the category of "crackpot" suggestions. Here is an illustration, given in the hope that it will not cause offense to anyone.

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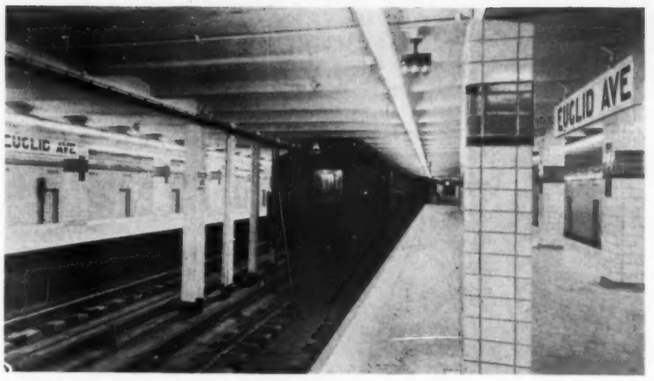

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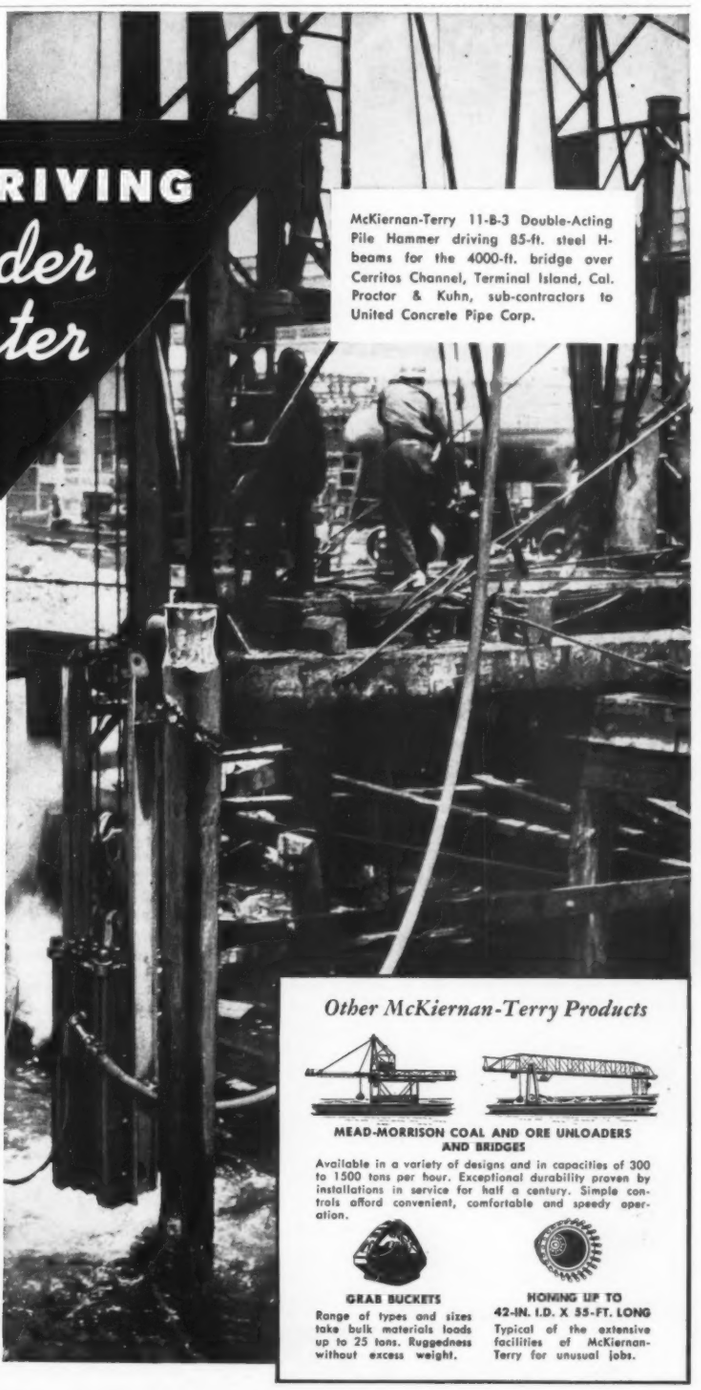
(Continued on next page)

PILE DRIVING *under water*



McKiernan-Terry 11-B-3 Double-Acting Pile Hammer driving 85-ft. steel H-beams for the 4000-ft. bridge over Cerritos Channel, Terminal Island, Cal. Proctor & Kuhn, sub-contractors to United Concrete Pipe Corp.

1170 STEEL PILES had to be driven under water during the construction of this longest, highest vertical-lift bridge on the Pacific Coast. 390 steel piles, 85 feet long, were hammered full length, without follower, into unstable soil to required elevation. At cut-off the anvil block or base of the hammer was 12 feet below the surface of the water. In addition, 780 shorter piles were driven for the lift-span piers. • McKiernan-Terry Double-Acting Pile Hammers were chosen for the job because (1) they were the first pile hammers developed for underwater driving and (2) they have held an unsurpassed reputation for underwater driving dependability through the years. • 17 sizes of hammers and extractors are available in the complete McKiernan-Terry line. Write for bulletin giving all the facts.

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MK801A

Building Subways For New York City

(Continued from preceding page)

earth for the BMT Brighton line through the terminal moraine under Flatbush Avenue and for the IND south of Prospect Park, the latter being a concrete-block-lined tunnel built by the use of a shield in free air.

A feature of rock tunneling is the control of rock dust in drilling operations, to minimize the effect of rock dust in producing the disease known as silicosis. Dust control is accomplished by the use of water-liner drills or by special ventilation systems directed to the heading, or by both methods.

Blasting charges are limited by proximity of buildings and important underground structures; also limitations are sometimes placed on blasting at night by the proximity of hotels, hospitals, and residential areas. Specifications require that contractor's working machinery shall be designed to operate with a minimum of noise. In Sixth Avenue, Manhattan, shaft-head works were soundproofed to minimize the noise of rock handling at the surface.

"Soldier beam" bracing system in place. The vertical steel H-beams are spaced close together along the sides of the cut, and support the horizontal timber lagging.

Subaqueous Tunnels

Of the 13 subaqueous tunnel crossings carrying rapid transit, all but two were shield-driven. The first Harlem River tunnel—a twin cast-iron tube of the Lenox Avenue subway—was constructed in a closed under-water caisson. Ten years later, the Lexington Avenue 4-tube steel-plate tunnel under the Harlem River was constructed by the sunken-tube method.

Although the process of constructing shield-driven tunnels has not materially changed over the years and is, therefore, well known to tunnel engineers, a brief statement of the methods of construction of the Board's shield tunnels may have its place in this discussion.

Shield-driven subaqueous tunnels are composed of cast-iron rings and lined with concrete. These tunnels are constructed behind a hollow-steel cylinder or shield, of slightly larger diameter than the tunnel, which is advanced by hydraulic jacks reacting against the cast-iron rings. The shield is usually assembled at the bottom of the river shaft. When two shields are used they are started out of the shaft from opposite river banks in free air and progress toward the center of the river. A series of compression chambers or locks are installed (one man lock and two material locks) after the shield has advanced a short distance from the shaft, and compressed air is applied to the heading except when the tunnel is passing through sound rock.

Much of the soft material of the riverbed is pushed aside as the shield advances. The balance is taken in through openings in the shield and passed out of the tunnel through the material locks.

The metal tunnel-lining rings are erected by hydraulically operated erector arms attached to the shield. There is an annular space between the outside of the rings and the tail of the shield, through which grout, or pea gravel and grout, are blown, to fill the voids outside the tunnel lining that are created by the difference in diameters of the tunnel and shield. Filling of these voids minimizes loss of ground and movement of the earth around the tunnel.

A feature of subaqueous-tunnel construction is the use of compressed air. This must be provided in ample quantity, both for normal use and for emergencies. Unless there were sufficient air pressure, the tunnel would be flooded. On the other hand, air under pressure in a tunnel tends to escape to the surface through the riverbed. When large quantities of air escape, a serious situation develops. It is called a "blow". Tunnel workmen, aptly called "sand hogs", have been blown from a tunnel heading up through the riverbed to the surface of the river. This happened to one of the sand hogs during the construction of the IRT Battery tunnel of the first subway. Fortunately, he was fished

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PENFLEX
HEART OF INDUSTRY'S LIFE LINES

out of the river alive, but needless to say, somewhat the worse for wear. It happened again during the construction of the IRT-Whitehall Street tunnel. This time, three men were blown from the tunnel heading up through 30 feet of muck to the surface. One of the three survived.

To overcome the tendency of the air to escape in large quantities, and thus to minimize the possibility of flooding the tunnel, where lack of cover or of sufficient resistance of the rivedbed warrants it, a temporary clay blanket is deposited over the tunnel in advance.

Those who work in compressed air must be physically sound and rugged, as they are required to undergo compression and decompression on each shift. Their hours of labor per shift are limited by law, and are decreased as the pressure increases up to 50 psi above atmosphere, the legal limit of pressure in this state. Decompression between the tunnel heading and atmosphere takes place in the man lock previously referred to. The time required to decompress depends, of course, upon the pressure in the working chamber and is likewise controlled by law. This process should never be hurried as the penalty may be a severe case of caisson disease called "bends" which sometimes results from too rapid decompression. Caisson disease can be very painful and may result in death.

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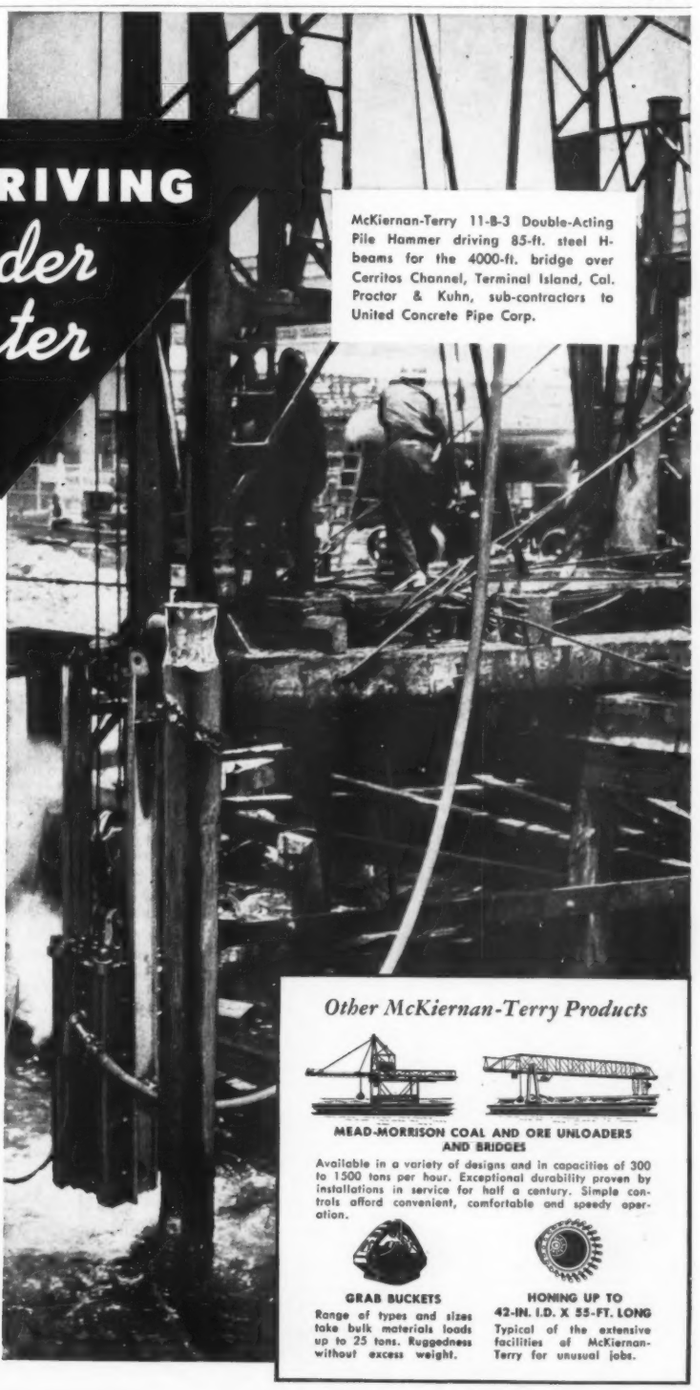

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MK801A

Building Subways

(Continued from preceding page)

grillages are installed in the piers at roof level, and as soon as the steel subway bents have been erected, the grillages are supported on the top flanges of the roof beams, thus transferring the load of the elevated column to the subway steel. The lower portion of the supporting pier is then removed.

Rearrangement of Utilities

The Rapid Transit Law requires that whenever the construction of the subway shall interfere with any subsurface utility structures in the streets, requiring removal of or changes in these structures, the work must be done "in such manner as to interfere as little as possible with the works of business of the owners of any such subsurface structures". The law further requires that upon completion of construction of the subway such subsurface structures shall be restored as nearly as may be to the condition in which they were previous to the construction of the subway. The maintenance, support, and restoration of surface and subsurface structures is a major factor in the cost of subway construction.

Track Laying

As soon as invert, walls, and roof of the subway structure have been built and the general contractor's plant and equipment removed, other contractors skilled in laying the track and contact rails and still others skilled in the installation of architectural finish in the stations, move onto the job. The track work will include 100-pound ARA type-B running rail, control-cooled and heat-treated. This is installed in 33-foot lengths for convenience in handling into the subway. It will also include 150-pound bonded contact or 3rd rail. In recent years ballasted track has been replaced by a different type in which the rails are laid on 6 x 10-inch creosoted wood blocks embedded in concrete instead of in ballast. This type has proved satisfactory and has several advantages over ballasted track.

At the same time that track work is being installed, other contractors are placing architectural finish in the stations—construction crew rooms, toilets, change booths, turnstiles, station name tablets and direction signs, railings, tile walls, platform finish, and painting.

Mechanical Electrical Equipment

In addition to what is sometimes called civil-engineering construction, upon which I have dwelt up to now, there are many mechanical and electrical features of a great transit system. Since many civil engineers must cope nowadays with mechanical and electrical problems, it seems appropriate to mention briefly some of the more important mechanical and electrical features. Indeed, these features must be added to the structure to enable people to ride in that "hole in the ground".

There must be electrical energy to run the cars and light the subway, power the signal system, run the ventilation fans, etc. The major share of this energy is generated in the Board's three generating plants which together have a generating capacity of about 650,000 kw of energy. The balance of the energy is purchased from Consolidated Edison. Most of the energy generated in the Board's plants is 25-cycle; most of that purchased from Consolidated Edison is 60-cycle. High-tension ac current is transmitted from the generating plants through cables generally run inside the subway to rectifier and transformer stations spaced along the subway routes where the energy is rectified and stepped down to 600 volts dc for supplying power to the car motors through the contact rail.

The New York City Transit System has been aptly termed "the safest railroad in the world". This is due in no small part to the signal system which is designed to provide speed with safety and maximum capacity. The signaling of 742 miles of running track required 214 interlockings for the control of train movement at switches, and more than 7,500 wayside electrical signals with automatic trippers for setting the brakes in case the trains should pass a stop signal.

Hand in hand with the signal system is the telephone and emergency alarm system with boxes located along the trackways about 600 feet apart. At each of these locations, one can by pulling down a lever at once shut off power from the contact rail in the vicinity, transmit an audible alarm to a control point, and place in operation all exhaust fans affecting that particular area. Each alarm box is equipped with a fire extinguisher. Incidentally, more than 12,000 fire extinguishers are in the cars and along the right-of-way.

Some 6,000 cars require facilities to store, inspect, and shop them. This feature constitutes a large part of the total cost of the subway system. A single subway car costs in the neighborhood of $100,000.

Lighting must be provided for subways, both at and between stations; also for crew and maintenance quarters, shops, offices, and other buildings. All lighting fixtures installed in new stations and buildings during the past few years have been of the latest fluorescent type with greatly increased light intensities. For reliability, the lighting system is fed from three independent sources on the IRT and IND Divisions and from two sources of the BMT Division.

The ventilation problem is one of dissipating heat generated within the subway by the car motors and resistors which liberate as heat about 85 per cent of the electrical

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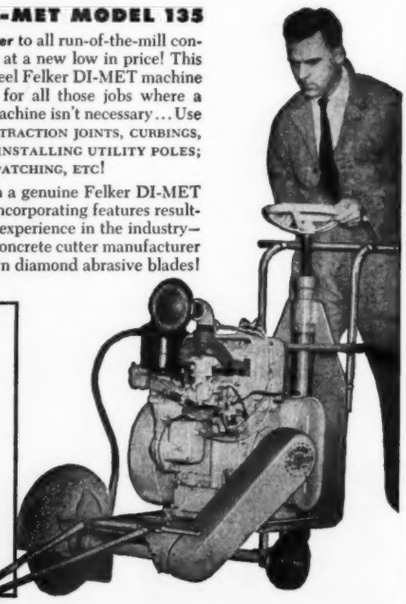
HUSKY SPINDLE—Mounted in Dodge S.C. self-aligning ball bearing pillow blocks. 1¾" single end arbor with keyway.



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energy. Other sources of heat are the friction of brakes and the not inconsiderable amount of heat liberated from the persons of the passengers themselves. Normal ventilation of the subway is accomplished by the piston action of trains which push the air ahead and force it to escape through sidewalk gratings at and between stations, while the partial vacuum created in the rear of the train pulls outside air into the subway. In addition to this action, fan chambers are built midway between each subway station. These chambers are equipped with remote-controlled motor-driven centrifugal exhaust fans for use in case of emergency, such as the removal of smoke from burning insulation. In many cases in the older subways, these fan chambers were not equipped with fans, but in the later IND subway fan equipment was installed before operation began. Studies are now under way looking toward a more effective ventilation system for future subways, and at the same time a reduction in the grating area in sidewalks.

In spite of the fact that subways are waterproofed, some seepage does occur. Also subways are subject to flooding from broken water mains and heavy storms. This water must be removed by pumping, since the subways are, with but few exceptions, below the level of the sewers. Several types of pumps are in use today, ranging from the compressed-air-operated reciprocating pumps installed in the earlier IRT subways, to the fully automatic, motor-driven centrifugal pumps of the later IND subways with capacities up to 1,500 gpm for a single unit and capable of pumping against heads up to 160 feet. Sewage from subway toilets is disposed of into the sewers by pneumatic sewage ejector equipment which operates automatically.

For vertical transportation at the deeper stations, the system is equipped with 28 elevators and some 75 escalators, which carry an estimated total of 180,000,000 passengers annually. Escalators operate normally at speeds of 90 fpm but in the latest installations this speed can be stepped up to 125 fpm. Escalators have about twice the capacity of stairways of equivalent width, and for this reason are used to accelerate the movement of passengers in some of the heavy-traffic stations where the rise would not otherwise warrant one.

When all of this equipment has been installed in the subways, tested and made ready to operate as an integrated whole, test trains are run for a period of several weeks to work in the equipment, expose and correct any "bugs" in it, give train crews experience on the particular line and provide data from which accurate operating schedules can be prepared.

Organization

Design and supervision of subway construction has with but few exceptions been handled by the engineering forces of the Board and its predecessor bodies who have accumulated 50 years of experience in the specialties involved. Prior to 1940, the mechanical and electrical equipment of the IRT and BMT lines was installed by the operating companies under their operating contracts with the city, but the equipment of the IND subway was handled by the Board's engineering forces.

I have tried to describe in as much detail as possible how a subway is designed, constructed, and made ready for operation. You will probably notice there are a number of steps necessary to complete a subway line for operation. These should take a total of about 5 years after the first construction contract is let.

Cost

How much does a subway cost completely equipped and ready to operate? At present prices a 2-track subway in outlying areas of Brooklyn and Queens will cost between $13,000,000 and $15,000,000 a mile, including overhead and interest charges. In areas of upper Manhattan and The Bronx, this cost will be about $500,000 more, while in lower Manhattan still another $500,000 must be added, bringing the cost in that area up to between $14,000,000 and $16,000,000 a mile.

What did its transit system cost the City of New York to date? The total expenditures were approximately $1¾ billion. To reproduce the system at today's prices, the cost would be in excess of $4 billion. In these days of astronomical figures after the dollar sign, such sums may not seem outstanding as reflecting the magnitude of this undertaking. But in past years the subway system of New York was considered one of the world's greatest engineering achievements.

Data on Adjustable Shore

Literature is available on an adjustable shore made by the Marvel Equipment Co., Inc., 1055 Bowen St., Oshkosh, Wis. The adjusting screw of the shore is completely encased. It is turned by a 1-piece adjusting bar and locking pin. Maximum extension of the shore is 15 feet.

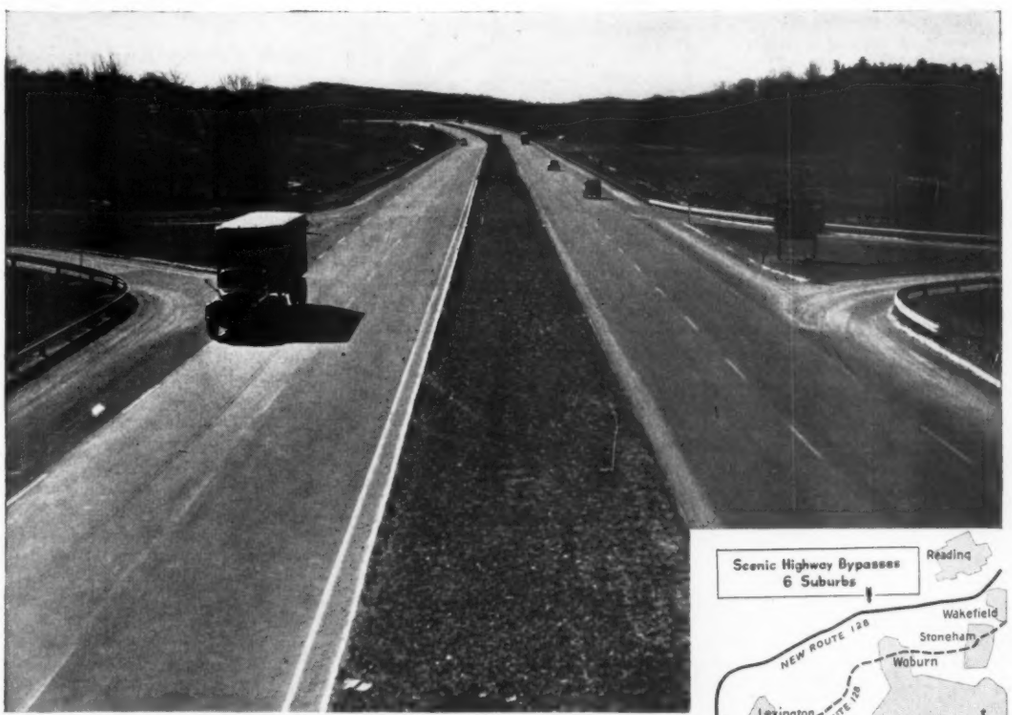
An adjustable trestle for scaffolding is also offered. The trestle holds crossbeams with clamps and thumb screws. A 4-piece column clamp in 36 and 48-inch lengths is shown.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 174.

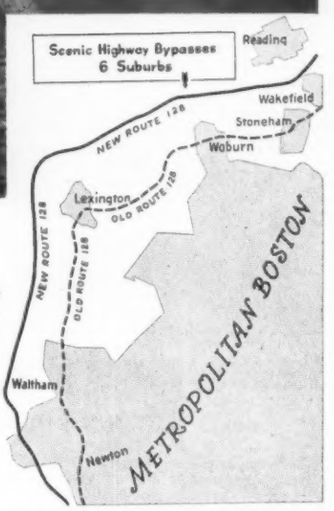
Corrections

In the May issue of CONTRACTORS AND ENGINEERS, page 40, the cement bin was captioned incorrectly. It should have been labeled a Lippert 750-barrel bulk cement plant.

Viber units were used to vibrate the steel forms for the storm sewer tunnel described on page 118 of the May issue.



New bypass helps motorists rim the hub in about 30 minutes. The new 4-lane highway also connects Worcester Turnpike with Newburyport Pike.



New Bypass Unsnarls Traffic in Boston Area

Here's a good example of the work state highway departments and roadbuilders are doing to relieve congested highways throughout the country. The new Northern Circumferential Highway eliminates congestion, saves tempers and time.

Not long ago, motorists using Route 128 outside of Boston had to tackle traffic in six suburbs. This meant a slow, tortuous 70-minute trek through city streets filled with cars and trucks.

Today, a new 4-lane highway helps motorists rim the hub in about 30 minutes. For this reason, approximately a million cars a month now use the new, 22-mile Northern Circumferential Highway.

This new highway was completed by seven contractors at a cost of $18,000,000. Bethlehem furnished structural steel, reinforcing steel and guard rails.

Old Route 128 ran through six Boston suburbs. New route relieves former congestion like this shown here on outskirts of Boston.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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Timber Bridge Hardware • Sheet- and H-Piling

Bulletin on Tractor

The Tournatractor is described in a 28-page booklet in color. The unit is an electrically controlled rubber-tired tractor available with 10 interchangeable attachments.

Action shots and cut-out photos of parts of the machine illustrate its characteristics. Among other features described are the transmission and torque converter.

To obtain this literature write to Advertising Department, R. G. LeTourneau, Inc., Peoria 2, Ill., for Bulletin TD-216, or use the Request Card at page 18. Circle No. 281.

New Multipack Division

Multipack, Inc., manufacturer of block machinery, has acquired Multiplex Machinery Co., Elmore, Ohio, as a subsidiary division.

Officers of the corporation are R. A. Parker, Chairman; Joseph J. Parker, President; John S. Parker, Vice President and Sales Manager; A. E. Stitt, General Manager; and Nelson C. Johnson, Plant Manager.

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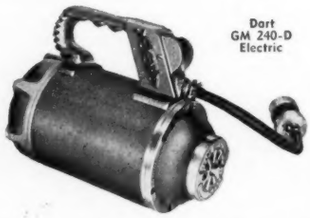

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For further information write to Unit Crane & Shovel Co., 6411 W. Burnham St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 243.

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A line of guides for hand-held cutting torches is illustrated in literature from New Era Engineering Co., Dept. B28, 458 W. 29th St., Chicago 16, Ill. The Neeco guides, which are attached to torches without special tools, make for greater accuracy. They are used for cutting circles, straight lines, angles, bevels, and sundry shapes.

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Avoid Legal Pitfalls

Edited by A. L. H. STREET, Atorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Federal Job Wages

THE PROBLEM: *Bidding specifications on a Federal flood-protection project specified minimum wage rates that had been fixed by the Secretary of Labor. The District Engineer knew that the rates would be increased shortly, but did not so inform bidders. Having had to pay the higher rates later approved by the Secretary, was the contractor entitled to recover from the Government the excess over the rates listed in the bidding spex?*

THE ANSWER: Yes. (Binghamton Construction Co. v. United States, 107 Fed. Supp. 712, decided by the United States Court of Claims.)

The court said that before issuing the invitation for bids the engineer "should have made certain that the rates in effect were those he was representing them to be".

The Court of Claims cited one of its earlier decisions in which a contractor was declared to be entitled to collect an amount, in a similar case, to compensate for the difference between wage rates which he had been told were in effect—and on which he had relied in estimating costs before he bid on a job—and higher rates which he had to pay. (Albert & Harrison, Inc. v. United States, 68 Fed. Supp. 732.)

Owner Incurred Liability For Injury to Contractor

THE PROBLEM: *Defendant employed plaintiff to pour a layer of cement over another layer on a floor of a building that had been damaged by fire, after defendant's employee had chipped the lower layer preparatory to plaintiff's work. Due to a defect probably caused in the chipping, plaintiff's foot penetrated the floor, into a tank of scalding water beneath. Was defendant liable to plaintiff for resulting injury to him?*

THE ANSWER: Yes. (Bazzoli v. Nance's Sanitarium, Inc., 240 Pac. 2d 672, decided by the California District Court of Appeal, Third District.)

The court followed a rule of law recognized by most, if not all, courts, to the effect that an owner of premises who invites anyone to come on his premises to perform work owes the latter a duty to warn him of any danger known to the owner—or that ought to be known to him—and not apparent to the invitee. The act of the chipper in weakening the floor was the act of the owner, his employer, so far as plaintiff was concerned.

Bid Bond Was Waived

THE PROBLEM: *Bidding specifications on a Federal job required that bids be accompanied by bonds to enter into a contract should the bid be accepted, and a governmental regulation provided that no bids would be considered unless accompanied by a bond. An award was made to the lowest bidder, a company which refused to enter into a contract unless the Government would agree to certain modifications, which it declined to do. The contract was awarded to the next lowest bidder. Four years later the Government deducted from an amount due the company on another contract enough to cover the loss sustained through the company's failure to contract on the first job. Did the Government have a right to do this?*

THE ANSWER: Yes. (Adelhart Construction Co. v. United States, 107 Fed. Supp. 845, decided by the United States Court of Claims.)

The court decided that the provision for a bid bond was for the exclusive benefit of the Government, which could waive the requirement when the bid was accepted. The decision was influenced somewhat by the fact that the company did not repudiate its bid when informed that it had been accepted, but attempted to secure more favorable contract terms than the bid contemplated.

Federal Labor Laws Applied to Dam Job

THE PROBLEM: *In order to prevent injury to power machinery used in the construction of a flood control dam across an unnavigable stream, men were employed to remove trees and other materials from the reservoir area. Did the wage provisions of the Federal Fair Labor Standards Act apply to these men?*

THE ANSWER: Yes. (Tobin v. Pennington - Winter Construction Co., 198 Fed. 2d 334, decided by the United States Court of Appeals, Tenth Circuit.)

With one of the three judges dissenting, it was decided that the project was sufficiently related to navigation on the Missouri and Mississippi Rivers to bring it within the Federal labor laws governing interstate commerce. It should not, for this purpose, be treated as separate construction.

Owner, Contractor Share Blame: Former Cannot Claim

THE PROBLEM: *A property owner won a suit against an adjacent property owner and his contractor for damage done to the first owner's*

(Concluded on next page)

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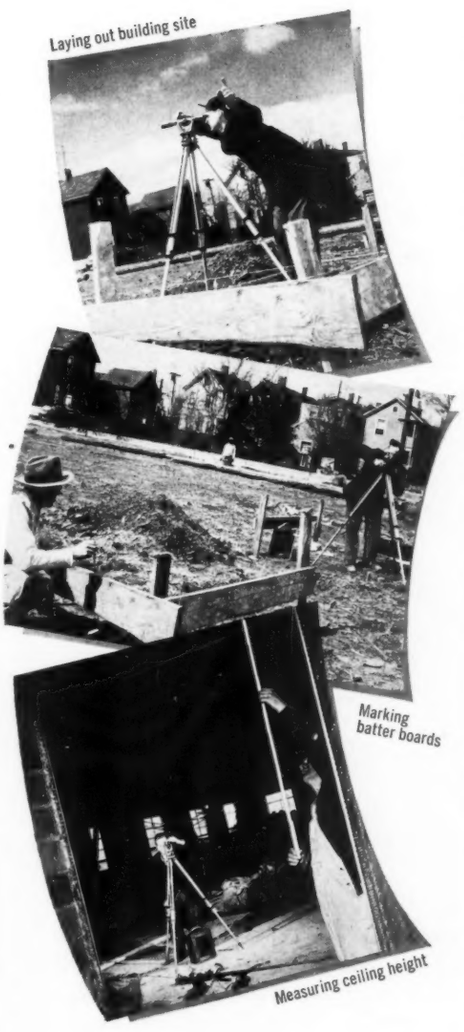

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building by negligent excavation. The evidence showed that the damage was partly attributable to the plans and specifications furnished by defendant owner and to construction permitted by his supervising engineer, as well as to the fault of the contractor. Was the defendant owner entitled to reimbursement by the contractor?

THE ANSWER: No. (Good Neighbor Federation v. Pathe Industries, Inc., 114 N. Y. Supp. 2d 365, decided by the New York Supreme Court, Trial Term, New York County, Part VI.)

The court noted that both defendants were equally at fault in failing to comply with statutory requirements as to shoring, etc., and therefore neither could shift the resulting damages wholly upon the other.

Need Not Specify Conditions Or Limit Forfeit to Damages

THE PROBLEM: *California statutes required that bidders on a sanitary district job deposit a bond or check for 10 per cent of the bid, to be forfeited on failure to contract after acceptance of the bid. (1) Was a bond forfeitable if it did not specify the conditions on which a forfeiture might be declared? (2) If forfeitable, was the district limited to collection of actual damages resulting from the bidder's refusal to contract?*

THE ANSWERS: (1) Yes. (2) No. (Inyokern-Sanitation District v. Haddock-Engineers, Ltd., 224 Pac. 2d 709, decided by the California Supreme Court.)

On the first point, the court followed a rule adhered to by most courts, that the conditions on which any statutory bond is forfeitable need not be specified in the bond; the statutory provisions are automatically part of the document.

On the second point, the court said that, whether 10 per cent of the amount of the bid be regarded as a penalty or as an estimate of damages suffered by the district through refusal of the successful bidder to contract, it was recoverable on forfeiture of the bond, without proof as to the extent of actual damage sustained. The court observed that, because it would always be difficult, if not impossible, to compute actual damages, the statute appropriately fixed 10 per cent as the amount collectible in case of default.

Budget Irregularity Didn't Void Contract

THE PROBLEM: *The validity of a contract to erect a county bridge in Missouri depended upon a statutory budget provision. Such provision was made prematurely by about two weeks. Did that invalidate the contract?*

THE ANSWER: No. (Adair County v. Urban, 250 S. W. 2d 493, decided by the Missouri Supreme Court.)

The decision rested upon the fact that the irregularity did not prejudice the county. The court distinguished cases where violation of budget statutes had invalidated contracts: These were instances of incurring obligations in excess of the amount provided by the budget, or where the outlay which it was sought to enforce had not been budgeted at all.

Contract Not Annulled By Engineer's Interest

THE PROBLEM: *After an incinerator construction contract had been awarded by a city, an engineer who had assisted in drawing the plans and specifications for the city became associated with the contractor. But he had no connection with the successful bidder while working for the city. Was the contract legal?*

THE ANSWER: Yes. (Hinds v. State, 59 So. 2d 634, decided by the Florida Supreme Court.)

The court emphasized the fact that there was no claim of fraud in the transaction.

Watchman Not "Seaman"

THE PROBLEM: *A gravel barge, so overloaded as to be top heavy, was moored near a bridge under construction. The barge capsized, fatally injuring a watchman on board. The barge was not self-propelling and the watchman was not classifiable as a seaman. Was the employer liable under Federal statutes governing acccident to seamen and longshoremen?*

THE ANSWER: No. (Posavec v. Merritt-Chapman & Scott Corp., 106 Fed. Supp. 170, decided by the United States District Court, Southern District of New York.)

Wage Law Not Applicable To Municipal Employees

THE PROBLEM: *The New York Constitution forbids permitting employees of a contractor or subcontractor engaged in public work to work more than 8 hours a day or 5 days a week, or for less wages than prevail in the same trade in the locality. Does the prohibition extend to municipal Civil Service employees?*

THE ANSWER: No. (Corrigan v. Joseph, 106 N. E. 2d 593, decided by the New York Court of Appeals.)

The court quoted a statement made in the Constitutional Convention at which the prohibition was adopted: "Unless the laborer, workman or mechanic is in the employ of a contractor or subcontractor, it does not apply."

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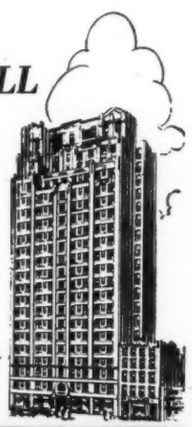

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- Wheel-Type—Fastest Digging Method
- 12-Speed Crawler Transmission
- Wider Range of Trench sizes
- Generously Powered

IN MORE PLACES

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- Full-Crawler Mounting—Completely Maneuverable
- Fast Boom Hoist
- Shiftable Conveyor
- Truck-Speed Portability—Safer, *Faster* Job Moves

AT LESS COST

- *One* Machine for *Many* Types of Jobs
- Digs All Soils in All Weathers
- Less Property Damage—Crawlers Save Lawns, Walks, etc.
- Unit-Type Construction
- Lower Maintenance Costs
- Longer Life

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CLEVELAND TRENCHER CO.
Pioneer of the Modern Trencher
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Model GPX-D

Model PS

Single axle, spring-mounted platform or float.

Model GXTT

Gooseneck type cargo carrier tandem axle, four dual wheels.

Model MSO-D

Multiple axle drop bed semi.

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MODEL GPX (Drop or Flat Deck)

16 thru 35 ton capacities . . . especially designed for heavy cantilever loads. Exclusive TRANSPORT tandem axle assembly with heat treated tubular cambered axles, give more tire miles and full oscillation over uneven roads. 15 tires standard, 20" tire models available. TRANSPORT Semi-trailers fit most single or tandem axle truck tractors.

FOR ADDED SERVICE . . .

Single or dual axle TRANSPORT front dollies convert semis to full trailers easily and quickly.

WRITE FOR COMPLETE INFORMATION

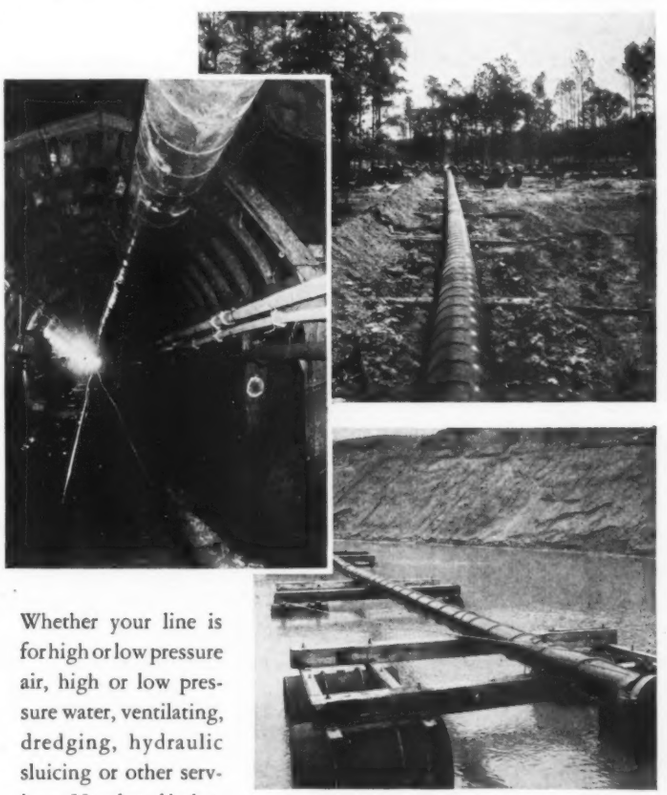
TRANSPORT TRAILERS, INC.

TRANSPORTATION ENGINEERING A SPECIALTY

CEDAR RAPIDS, IOWA, U.S.A.

What's Your Line?

For Construction Pipe Lines...the Answer is NAYLOR



Whether your line is for high or low pressure air, high or low pressure water, ventilating, dredging, hydraulic sluicing or other service, Naylor lightweight pipe takes the guess-work out of your piping requirements.

Naylor Lockseam Spiralweld pipe is easy to handle and install. Naylor Wedge-Lock couplings speed connections, and with Naylor pipe, give you the all-around piping combination for your requirements.

Write for Bulletin No. 507 on line pipe and Bulletin No. 513 on Wedge-Lock couplings.

NAYLOR PIPE COMPANY

1270 East 92nd Street, Chicago 19, Illinois

New York Office: 350 Madison Avenue, New York 17, New York

Manufacturer Memos

Lt. Gen. Lewis A. Pick, Vice Chairman of Georgia-Pacific Plywood Co.

Lt. Gen. Lewis A. Pick Takes Industrial Post

Lt. Gen. Lewis A. Pick, formerly Chief of the Corps of Engineers, U. S. Army, has been elected to serve as Vice Chairman of Georgia-Pacific Plywood Co., Olympia, Wash.

After 36 years of service, Gen. Pick, who served overseas in both World Wars, retired from the U. S. Army on February 9, 1953. At the beginning of World War II, he supervised the building of 56 airfields and hundreds of camps in 15 months. Sent to Burma in 1943, he supervised the construction of the 485-mile-long Ledo Road, known as "Pick's Pike".

Gen. Pick was the initiator of the "Pick Plan", now known as the "Pick-Sloan Plan" for controlling and obtaining useful work from the waters of the Missouri River system. The General is also responsible for the planning, organization, and supervision of the construction of the Thule (Greenland) Airbase far within the Arctic Circle.

International Harvester, Bucyrus-Erie Agreement

An arrangement under which Bucyrus-Erie Co.'s industrial tractor equipment will be sold, distributed, and serviced by International Harvester Co., has been agreed upon by the two companies.

For many years Bucyrus-Erie Co., South Milwaukee, Wis., has manufactured bulldozers and scrapers for International Harvester's industrial tractors. This equipment was sold and serviced directly by Bucyrus-Erie to International Harvester distributors. Since Bucyrus-Erie has need for more facilities to manufacture its products other than tractor equipment, the company has now decided to withdraw eventually from tractor-equipment production.

After January 1, 1954, International Harvester Co., Chicago, Ill., will take over the sale, distribution, and servicing of Bucyrus-Erie tractor equipment. Over a period of time, without interrupting its production, Bucyrus-Erie will discontinue the manufacture of its present tractor-equipment line, and Harvester will manufacture these products.

Nelson New Distributor For Remington Arms Co.

A new national distributor for the Remington stud driver and fastener studs will be Nelson Stud Welding Division of Gregory Industries, Inc., Lorain, Ohio, it was announced by Remington Arms Co., Inc., Bridgeport, Conn.

Remington equipment and studs are being carried in stock at Nelson Stud Welding factory branch warehouses in Philadelphia, Pa., Chicago, Ill., Oakland, Calif., as well as in Lorain. Arrangements are being made for stocking at other field offices to expedite delivery of Remington products in the 40 areas where Nelson has representation.

N. Y. Offices for Hyster

Last month Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg., formally opened its New York dealership and national accounts headquarters. Hyster Co.-New York, occupies a large new building at 10-10 Bridge Plaza South, Long Island City, N. Y., which houses sales and services departments as well as offices.

Simultaneously with Hyster's opening, where Straddle Trucks, Karry Kranes, and Turret Trucks were on display, came the company's announcement of two new fork-lift truck models for 1953.

Don Shaffer is Manager of Hyster Co.-New York, while Ken Mattfeld is Office Manager and Allen Talcott, Service Manager.

Joy Acquires Subsidiary

Joy Mfg. Co., Pittsburgh, Pa., maker of mining equipment and industrial products, announces the acquisition of Barnes & Reinecke, Inc., Chicago, Ill., an engineering firm specializing in mechanical research and development.

Barnes & Reinecke will retain its name and present staff of personnel. Located at 230 E. Ohio St., Chicago, the company has, in addition to engineering facilities, a testing laboratory and prototype assembly area.

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Strike Back!

GIVE

TO CONQUER CANCER

William S. Burdick is the new Vice President in Charge of Engineering of Harnischfeger Corp.

Harnischfeger Veteran Becomes Vice President

After 24 years of service with Harnischfeger Corp., Milwaukee, Wis., manufacturers of construction and industrial equipment, William S. Burdick has been appointed Vice President in Charge of Engineering. In his specialized field of excavator designing, Mr. Burdick made important contributions to the development of P & H excavators.

W. E. Hawkinson, Jr., assumes Mr Burdick's former position of Sales Manager of Harnischfeger's Excavator Division.

New Homelite Managers

E. W. McClellan, who has recently been appointed Midwest Regional Manager of Homelite Corp., Port Chester, N. Y., opened a new office at 120½ S. Grove Ave., Elgin, Ill. He will be in charge of sales and service activities of Homelite's district offices in Detroit, Mich.; Cleveland and Cincinnati, Ohio; Indianapolis, Ind.; Melrose Park, Ill.; Kansas City, Mo.; and St. Paul, Minn.; as well as branch offices in Toledo, Ohio; Grand Rapids, Mich.; Milwaukee, Wis.; St. Louis, Mo.; and Omaha, Nebr.

The following changes in branch and district management were also made: Francis Darrow is Manager of the Buffalo District Office; Ted Skroch is Manager of the Indianapolis District Office; Harold E. Wiersum manages the branch office in Grand Rapids, Mich.; and James W. Thompson took over the Charlotte, N. C., District Office.

Homelite manufactures gasoline engine-driven pumps, generators, blowers, and chain saws.

Baker-Lull Appoints

Richard T. Tiebout has been named Vice President of Baker-Lull Corp., Minneapolis, Minn., manufacturer of hydraulic loading and materials-handling equipment for industry and the construction trades.

Dale McKee, former Chief Engineer, has been elected Vice President of Engineering. Succeeding Mr. McKee will be William Norlander, promoted from the post of Assistant Chief Engineer.

Two further appointments are those of William Delaney as Service Manager and David S. Hansen as Sales Manager.

Buy U. S. Defense Bonds

Rocky Mountain Office For Allis-Chalmers

The establishment of headquarters at Denver, Colo., has been announced by the General Machinery Division of Allis-Chalmers Mfg. Co., Milwaukee 1, Wis. This main office will combine the district and branch offices of Salt Lake City, Utah; Phoenix, Ariz.; El Paso, Texas; Spokane, Wash.; and Denver.

Manager of the Rocky Mountain Region office will be Richard D. Moody who, since 1950, has been manager of the Los Angeles, Calif., district office. Mr. Moody's former post will be filled by Richard L. Engel.

U. S. Rubber Appoints

Chester W. Ort has assumed a new position with United States Rubber Co., New York, N. Y. He is Assistant Divisional Manager of the western division of the U. S. Tires Division. With headquarters in San Francisco, Calif., he will give special emphasis to off-the-road tires and their distribution. E. S. Morgan, formerly District Manager in Seattle, Wash., succeeds Mr. Ort, and is succeeded in turn by D. E. Kennedy, who was Assistant District Manager in Los Angeles, Calif.

Three new district managers representing the division in the midwest are: Edwin V. Murphy at St. Louis, Mo.; Harry E. Collins at Minneapolis, Minn.; and Harold U. McGee at Oklahoma City, Okla.

In its Mechanical Goods Division, U. S. Rubber has named Edward T. Day as Manager of Branch Sales, while the newly appointed Manager of Industrial Sales is Matthew J. Delehaunty.

Bought one DW21, reordered 6 more in 14 months!

DAVE GUSTAFSON & CO., INC.
HIGHWAY CONTRACTORS

502 EAST SIXTH — PHONE 8-3351 — SIOUX FALLS, S. D.

January 9, 1953

Caterpillar Tractor Co.
Peoria,
Illinois

Gentlemen:

Our experience in the contracting business dates back to 1926. Our original equipment consisted of one Caterpillar Model Sixty Tractor.

When Caterpillar came out with the DW10 rubber-tired Tractor, we bought two of these units with scrapers as we felt that moving dirt on rubber-tired rigs was a better way of getting the job done. Caterpillar didn't let us down!

In July of 1951 we bought our first DW21 Tractor-Scraper outfit. The performance of this machine was so good that we added two more units in February 1952. Since that time we have purchased four more DW21 Tractor-Scraper outfits; two in April and two more in September of 1952 for our road building projects in South Dakota, because we have found that this is the cheapest method known today for handling dirt on projects such as ours.

When we bought the two DW21 Tractor-Scraper units in September we had just started work on a sub-contract from Peter Kiewit Sons Co. for grade construction of the "four lane highway" from Weaver Airforce Base to Rapid City, South Dakota, consisting of 650,000 cubic yards to be moved in 90 calendar days. Hauls on this job ranged from 400 feet up to 2 1/4 miles one way. Working a single ten hour shift, six days a week our DW21s really put it across on time.

In addition to our DW21s, we have ten Caterpillar crawler Tractors, and five Caterpillar No. 12 Motor Graders.

Our DW21s have the power and stamina to stay on the job and keep the dirt "moving" without costly breakdowns and delays. We feel that Caterpillar performance is second to none and is backed up by the best parts and service facilities to be found.

Very truly yours,

DAVE GUSTAFSON & CO.

L. S. Malm

L. S. Malm
Vice President

Dave Gustafson & Co., Inc., of Sioux Falls, S. D., bought its first Caterpillar DW21 and Scraper in July, 1951. By September, 1952, it had a fleet of 7 of these earth-eating Cat* units.

Why?

L. S. Malm, vice president of the company, has a telling explanation:

"We have found this is the cheapest method known today for handling dirt on projects such as ours."

Don't keep throwing good money after bad on less capable earthmoving equipment. Have your Caterpillar Dealer demonstrate the money-saving advantages of having DW21s on your side.

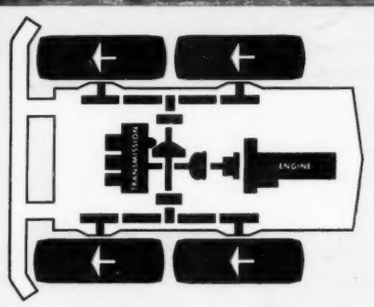
Caterpillar Tractor Co., Peoria, Illinois.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

NAME THE DATE... YOUR DEALER WILL DEMONSTRATE

the tractor with anti-friction drive



Free-rolling tires reduce power loss, upkeep costs

If trucks still ran on metal wagon wheels instead of on pneumatic tires, you'd know what to expect. Slower speeds, harder riding, wasted power, and higher maintenance bills, to mention a few disadvantages. The same limitations apply to slow-moving crawler tractors, compared to rubber-tired Tournatractors. Crawlers naturally run slower — 3 to 8 mph as compared to Tournatractors' 19 mph. And, of course, crawlers ride harder, drive harder, than Tournatractor, and their tracks cost more to maintain.

Think it over

Obviously, with crawlers, you get a major loss of power due to the friction of hundreds of wearing parts grinding in grit. Power that should be converted to speed is spent in turning metal against metal in bearings that just can't be sealed against sand and abrasive materials. So with crawlers you get the slow, "lumber wagon" type of operation . . . plus expense and delay of continuous replacement of ground out sleeve bearings, pins, and track links.

With Tournatractor, big low-pressure tires roll *over* grit — do not grind *in* it. These tough, flexible treads operate on pressures as low as 12 lbs., provide top traction and flotation in any footing. And from engine to tire, your load rides on fast, smooth anti-friction bearings sealed against grit, dust, and water!

Tournatractor tires give you even better service than truck tires. They're bigger, stronger, tougher . . . better adapted to withstand shocks. Their tapered-bead provides *double* the rim-grip. This, plus wider rims, reduces tube, flap, and bead chafing . . . permits retreading . . . gives greater operating stability. Rayon-cord construction adds flexibility, strength, and long life to tire carcass.

Put this anti-friction, low-upkeep, speed and power to work for *you*, with 186 h.p., 19 mph Tournatractor. Ask for cost and output data on work like yours.

Tournatractor anti-friction drive gives you:

Greater speed for getting jobs done. Tournatractor's 19 mph speed forward (8 mph in reverse) increases daily output, reduces net cost. Outproduces crawlers 2 to 1.

Less expense . . . low-pressure rayon-cord construction resists body breaks, makes tire beads last longer. Time and expense of track maintenance are eliminated for good.

Less engine power wasted because rolling resistance and friction with big rubber tires is far less than that of slow-moving tracks, with their hundreds of moving parts.

Better service from retreads because tapered beads grip tighter, tires have a minimum of bead chafing, stand up for recap service.

Greater traction, flotation for successful operation in sand, mud, snow or ice. Goes anywhere — over rails, curbs or pavement without planking.

Greater shock absorption . . . less equipment maintenance needed . . . safer control . . . less operator fatigue.

Job-to-job mobility . . . fast, profitable job-to-job and on-the-job mobility, maneuverability. Eliminates loading and trailer expense . . . saves extra man hours.

Help in compaction . . . big tires roll out voids, don't break or crumble material . . . need less haul road maintenance.

Tournatractor—Trademark T-354-G-a

R. G. LeTOURNEAU, INC.
Peoria, Illinois

DOZING

With addition of A-frame, 2½-yd. bulldozer blade and controls, Tournatractor excavates, grades, handles all dozing jobs.

PUSHING SCRAPER

With bumper and pusher plate, Tournatractor usually keeps 4 scrapers going steady where a crawler would handle only 3.

WINCHING

67,000-lb. winch provides a fast, mobile trouble-shooter for lumbering and clearing, pulling mired trucks, heavy equipment.

PLOWING SNOW

V-type plow mounts on same A-frame as dozer . . . clears 12'4" width, 6½' height, 9' Snow Wing also available.

CLEARING TREES

Pusher reaches 23 ft. high on tree. As load increases, so does traction. Tree falls quickly, usually after single push.

LIFTING

Side-boom hoists 14 tons to maximum 12' height . . . 3 tons at maximum 12' reach. Has power up and down, carries full load anywhere.